Chapter Five

Impacts and Mitigation

Final Environmental Impact Statement

Vancouver Rail Project

Chapter Five Environmental Consequences

The purpose of this chapter is to review each resource discussed in Chapter Four and present potential impacts that the proposed project alternatives may have on the natural environment and the Vancouver community. Following impacts discussion, potential and suggested mitigation measures are discussed. **Exhibit 5-1** provides a summary of the alternatives that were used for this impacts and mitigation assessment. For the majority of resources, the potential impacts of the action alternatives are similar, sometimes with minor variations among the options under consideration. For this reason, and where appropriate, the potential impacts of the action alternatives are frequently discussed together. In addition, resource-specific impacts for the alternatives and options are summarized in exhibits throughout this chapter.

Alternatives B and I, at approximately Station 7034+00'. View looking south toward the soil bank. Drainage and slope erosion and surficial slides are the main geotechnical issues.

Earth (Soils and Geology)

This section discusses potential impacts and mitigation that the proposed alternatives may have on soils and geology in the study area.

What are the potential impacts to soils and geology in the study area?

Potential impacts have been identified based on field review, technical analysis, and historical research. The following discussion provides the general results of these findings.

Summary of Vancouver Rail Project Alternatives
Exhibit 5-1

ALTERNATIVE A	NO ACTION
Alternative B – Option 1	Easterly Bypass with Vehicular Overpass at West 39th Street
Alternative B – Option 2	Easterly Bypass, close West 39th Street
Alternative B – Option 3	Easterly Bypass with Pedestrian/Bicycle Overpass at West 39th Street
Alternative I – Option 1	Westerly Bypass with Vehicular Overpass at West 39th Street
Alternative I – Option 2	Westerly Bypass, close West 39th Street
Alternative I – Option 3	Westerly Bypass with Pedestrian/Bicycle Overpass at West 39th Street

Alternative A (No Action)

Alternative A would not result in any changes to the existing configuration of railbed and track, nor would it have any effect on soils or geology in the project vicinity.

Alternative B

The greatest potential impact relating to geology and soils is the stability of the planned major cuts and fills (and related retaining walls) along the alignment.

Alternatives B and I, at approximately Station 6952+00'. Proposed alignment at this location would require cuts into the existing slope nearly twenty feet deep. Existing slopes appear to be comprised of very hard silt and are only slightly dissected by surface runoff.

The engineering plan sheets in **Appendix A** illustrate the locations of these retaining walls by station location.[1] The locations are also summarized in Chapter 3 of this document. Retaining walls are required along the bypass line to retain cut slopes, and along the Northern Pacific siding to retain mainly fill slopes, because insufficient space is available to accommodate the required earthworks.

Cut slopes along the eastern side of the bypass line are planned to be up to one hundred feet deep, when measured from the top of the slope to track level. For preliminary design, cross-sections have been dimensioned on the basis of 2:1 slopes.

The project team's assessments of the identified seismic hazards are as follows:

- **Ground Rupture:** The nearest major fault to the project alignment is the Portland Hills Fault, located five miles to the southwest. It consists of a normal fault situated along the east limb of the Portland Hills Anticline that exhibits seismicity indicative of continuing displacement.[2] Review of available seismic mapping in the area indicates that the risk of ground rupture in the study area is low.

[1] *A station is an engineering measurement developed for a project. To find the locations of retaining walls and other project features, follow the station identifiers along the rail route.*
[2] *Phillips, 1987*

- **Liquefaction Potential**: Seismically induced liquefaction typically occurs in loose, saturated, sandy materials. The native flood deposit materials exposed in the existing cut slopes along the eastern side of the rail yard are sufficiently dense such that the potential for liquefaction of these soils is relatively low. However, more sandy layers could be present within the deposits, and could be liquefiable. Potentially liquefiable areas along the alignment include areas where saturated sandy fill or alluvial soils are present, and could underlie the flat, low-lying areas along the western portions of the site.
- **Seismically Induced Slope Instability**: The potential exists for slope instability to result from a seismic event. However, the stability of slopes will more likely be impacted by a high ground water table, freeze-thaw cycles and/or long term deterioration of slope materials.

Alternative I

The potential geology and soils impacts of Alternative I would be the same as those described above for Alternative B.

Would there be any construction impacts?

Construction impacts to soils and geology in the study area are not anticipated.

What mitigation measures are proposed to avoid and/or minimize impacts?

Final design would require a more refined understanding of the ground conditions. Additional geotechnical studies and analyses are recommended to support design efforts. As no subsurface information was obtained from the study area, an exploration program needs to be conducted to determine subsurface soil and ground water conditions.

Additional reconnaissance should also be performed. Retaining walls that are proposed along the cut slopes on the southern part of the project would help mitigate the potential for landslides. Re-vegetation of the cut and fill slopes would help reduce the risk of erosion.

In summary, what impacts would result from the proposed alternatives?

Exhibit 5-2 provides a summary of findings for the soils and geology analysis for the **Vancouver Rail Project**.

Air

Two analyses were performed for this environmental review: the potential impacts of changing vehicular traffic patterns; and the potential impacts resulting from shifting rail traffic to the proposed bypass.

Vehicular Traffic Analysis

The traffic impacts from the various alternatives were evaluated in a screening analysis to determine if air quality impacts were likely. The screening analysis involved evaluating signalized intersections in the general vicinity for significant

Soils and Geology—Summary of Potential Impacts*

Exhibit 5-2

ALTERNATIVE	IMPACT	EXPLANATION
Alternative A		No impacts
Alternative B		
Option 1	-	Cut and fill adjacent to existing slopes could create localized ground instability
Option 2	-	Same as Alternative B, Option 1
Option 3	-	Same as Alternative B, Option 1
Alternative I		
Option 1	-	Cut and fill adjacent to existing slopes could create localized ground instability
Option 2	-	Same as Alternative I, Option 1
Option 3	-	Same as Alternative I, Option 1

**Does not include construction impacts*

volume increases due to the proposed options for West 39th Street. Un-signalized intersections are not expected to significantly contribute to elevated pollutant concentrations. No signalization is anticipated due to this project. According to the U. S. Environmental Protection Agency (EPA) and air quality conformity guidance, an impact would be noted if there was a change in intersection configuration, change in signalization, or a minimum ten percent increase in traffic volumes.

Rail Bypass Analysis

The air quality impact analysis for the proposed Vancouver yard bypass looked at the potential impact from shifting rail traffic to the proposed bypass. The goal of the analyses was to determine if this shift would cause or contribute to violations of applicable National Ambient Air Quality Standards (NAAQS) for fine particulate matter, regulated as particles under 2.5 microns in diameter ($PM_{2.5}$), which are shown in **Exhibit 5-3**.

National Ambient Air Quality Standards for $PM_{2.5}$[a]

Exhibit 5-3

POLLUTANT	AVERAGING PERIOD	NAAQS
$PM_{2.5}$	24 hour[b]	65
	Annual	15

[a] All standards and increments are in units of μg/m3.

[b] The three-year average of the 98th percentile of concentrations is not to be at or above this level. Annually, this is approximated by the highest-8th high value for each receptor.

The analysis did not consider the decrease in impact from the traffic removed by the shifting of rail traffic to the bypass, and did not consider the potentially greater decrease in impact by relieving congestion in the rail yard. These decreases are likely to more than offset the increases in impact at some receptors due to shifting of rail traffic to the bypass. Thus, the analysis was quite conservative and potentially over-predicts the impact of the proposed project.

Would the proposed project have an impact on air quality?

The **Vancouver Rail Project** would not result in any increase in passenger rail service in the area. However, treatment of West 39th Street may result in changes to vehicular idling and movement. This analysis focuses on vehicular air quality.

Alternative A (No Action)

The No Action Alternative would not result in any changes to the existing configuration of railbed and track; there would be no additional passenger rail service offered. Therefore, there would be no change in the air quality as a result of passenger rail service.

Alternative B

Vehicular traffic and rail traffic were analyzed separately for this environmental analysis. The following presents findings of each analysis as they relate to Alternative B.

Vehicular Traffic

The rail crossing options at West 39th Street were evaluated for traffic impacts. The traffic impacts from the three options were evaluated in a screening analysis to determine if air quality impacts were likely. The screening analysis involved evaluating signalized intersections in the vicinity for significant volume increases due to the proposed changes to West 39th Street. Unsignalized intersections are not expected to significantly contribute to elevated pollutant concentrations. If significant new queuing would occur due to the proposed changes, a signaling would likely be incorporated and an air analysis would need to be conducted. No signalization is anticipated due to this project. According to EPA and Conformity Guidance an impact would be noted if one of two conditions were met for a particular intersection:

- a change in intersection configuration and signalization; or
- a minimum ten percent increase in traffic volumes.

All three options are identical with regard to potential air quality impacts. All options were evaluated for roadway impacts and it was determined that there are no capacity expansions to adjacent roadways within and surrounding the study area. According to traffic analyses performed for the West 39th Street options, none of the signalized intersections in the area will undergo changes in configuration or signalization timing. The Washington State *Guidebook for Conformity* states that directly affected roadways and other facilities experiencing changes in traffic volumes greater than ten percent as a result of the project should be analyzed in

Vancouver Rail Line Roadway Traffic Impacts

Exhibit 5-4

Signalized Location	Scenario 1: 2020 PM Peak Hour (No change to West 39th Street)		Scenario 2: 2020 PM Peak Hour (West 39th Street Rail Crossing Closure)			Scenario 3: 2020 PM Peak Hour (West 39th Street Rail Overpass)		
	Traffic Volumes (vehicles per hour)	*LOS**	*Traffic Volumes (vehicles per hour)*	*% Change compared to Scenario 1*	*LOS*	*Traffic Volumes (vehicles per hour)*	*% Change compared to Scenario 1*	*LOS*
78th Street at I-5 (1)	5021	C	5102	1.6%	C	4993	-0.6%	C
78th Street and Hazel Dell Avenue	3765	E	3858	2.5%	E	3729	-1.0%	D
78th Street at 9th Avenue	1710	B	1812	6.0%	A	1666	-2.6%	B
78th Street at Fruit Valley Road	1875	B	1955	4.3%	B	1846	-1.5%	B
39th Street at I-5 Northbound Ramp	2167	C	2159	-0.4%	C	2186	0.9%	C
39th Street at Main Street	3152	F	3010	-4.5%	E	3188	1.1%	F
Fourth Plain Boulevard at I-5 Northbound Ramps	3474	D	3483	0.3%	E	3443	-0.9%	D
Fourth Plain Boulevard at I-5 Southbound Ramps	2667	B	2689	0.8%	B	2670	0.1%	B
Fourth Plain Boulevard at Broadway Street	2543	D	2592	1.9%	D	2524	-0.7%	D
Fourth Plain Boulevard at Main Street	2686	D	2735	1.8%	D	2654	-1.2%	D
Fourth Plain Boulevard at Kauffman Avenue	1856	C	1979	6.6%	C	1802	-2.9%	C
Fourth Plain Boulevard at Fruit Valley Road	1756	D	1869	6.4%	D	1731	-1.4%	D
Mill Plain Boulevard at I-5 Northbound Ramps	3487	B	3544	1.6%	B	3509	0.6%	B
Mill Plain Boulevard at I-5 Southbound Ramps	4272	C	4310	0.9%	C	4270	-0.0%	C
Mill Plain Extension at Fourth Plain Boulevard (2)	2216	C	2169	-2.1%	C	2250	1.5%	C

Notes:

(1) The existing I-5 interchange with West 78th Street is currently under construction.

(2) The Mill Plain Extension and Fourth Plain Boulevard intersection was not evaluated for current conditions since construction of the extension was not complete at the time of this analysis.

**Level of Service*

Source: Revised Draft Report West 39th Street Rail Crossing Transportation Analysis, David Evans and Associates, April 14, 2000.

detail for air quality conformity. **Exhibit 5-4** (on the previous page) indicates that none of the signalized intersections will experience a significant change in volume with any of the proposed options.

Based on this screening analysis it is apparent that there will be no significant changes in the local air quality due to traffic impacts from Alternative B. Based on this information, and according to Conformity Guidance screening analysis, it was determined that there would be no significant air quality effects from on road traffic and that quantitative air quality modeling would not be required.

Although no significant air quality impacts are expected, it could be assumed that a decrease in vehicular idling at West 39th Street would result in benefits to air quality. However, Option 2 would disperse traffic into the surrounding neighborhoods, which could have a minor impact to air quality.

Rail Traffic

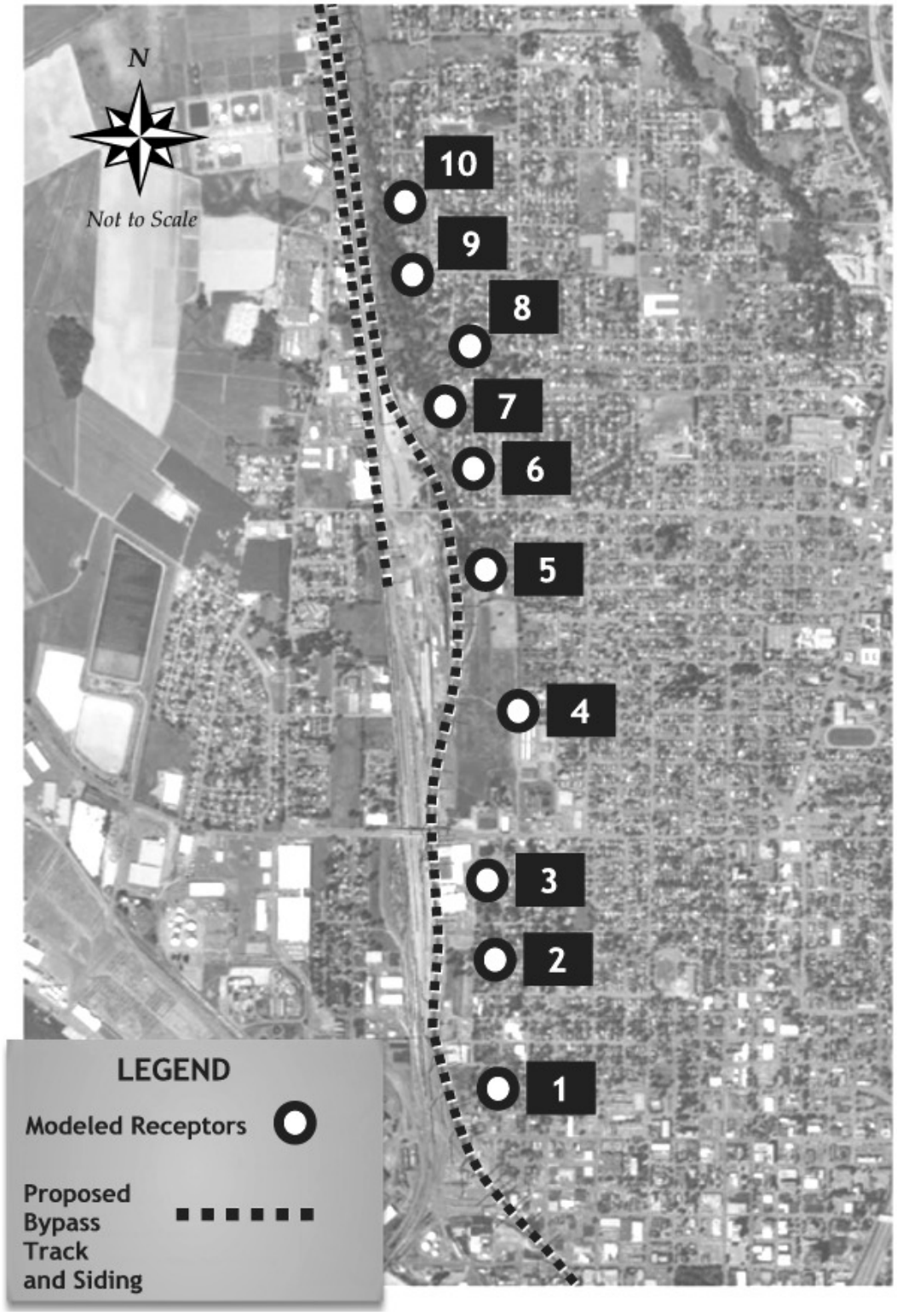
Ten locations (receptors) were identified in the study area for review of potential air quality impacts. An analysis was then performed for each of these locations based on idling locomotives and moving locomotives. **Exhibit 5-5** lists the location of these receptors and **Exhibit 5-6** shows their general location.

Location of Air Quality Receptors

Exhibit 5-5

MAP NUMBER	LOCATION
1	Mill Plain Road and Lincoln Avenue (approximately 125 feet west of intersection along Mill Plain Road on south side of street
2	20th Street and Lincoln Avenue (approximately 250 feet west of intersection along 20th Street on north side of street
3	24th Street and Lincoln Avenue (approximately 250 feet west of intersection along 24th Street on south side)
4	31st Street and Kaufmann Avenue (approximately 37 feet southwest of intersection near large industrial building)
5	36th Street and West Olive Street (southeast corner of intersection)
6	NW Pine Street and NW Olive Street (southeast corner of intersection)
7	NW 44th Street and NW Olive Street (approximately 250 feet southeast of intersection in/near trees)
8	NW 46th Street and NW Olive Street (southeast corner of intersection)
9	NW 48th Street and NW Cherry Street (approximately 250 feet southwest of intersection)
10	NW Walnut Street and NW Cherry Street (approximately 375 feet along Walnut, where Walnut curves, south side of street)

General Location of Air Quality Receptors
Exhibit 5-6



The modeled $PM_{2.5}$ and the 24-hour model results indicate that both the 24-hour and annual modeled concentrations are only a small percentage of the allowable NAAQS. The modeled concentrations were then added to recently monitored (year 2000) "background" $PM_{2.5}$ concentrations for comparison to the NAAQS. The background $PM_{2.5}$ concentrations are based on year 2000 monitoring data obtained from the EPA AIRData internet site (http://www.epa.gov/air/data/index.html) for the nearest $PM_{2.5}$ monitor, located in Vancouver at 8205 E. 4th Plain Boulevard. The background concentrations are based on the 2nd high reported value for 24-hour concentration of 42.7 ug/m3 (approximately 98% percentile of the 114 samples collected in the year 2000) and the annual arithmetic mean concentration of 10.75 ug/m3. The comparison indicated that the total concentration would not change significantly due to the bypass impact, and would remain below the NAAQS levels.

Detailed data and analyses are contained in the **Vancouver Rail Project Air Quality Impact Analysis Addendum.**

Air Quality Impact Summary

The results of the analysis demonstrates that the proposed bypass track at Vancouver Yard will not cause or contribute to violations of NAAQS for $PM_{2.5}$. The analysis indicated that the impact of shifting rail traffic to the bypass is insignificant. Furthermore, the decrease in impacts due to relief of congestion in the rail yard is expected to result in emissions and impact decreases that would more than offset the very small increase in $PM_{2.5}$ impact due to shifting traffic to the bypass. The results also indicated that idling locomotives, which in the model were closest to Receptors 5 and 6, have a larger contribution to impacts than do the moving locomotives. Therefore, the reduction of congestion in the yard, which is expected to be facilitated by the proposed bypass, should help to reduce the existing level of impacts from the yard.

Does the project conform to the State Implementation Plan?

The air quality impact evaluation described here constitutes a project-level conformity assessment. Based on the results of this air quality analysis, the **Vancouver Rail Project** conforms to the State Implementation Plan's (SIP's) purpose of attaining and then maintaining the one-hour and eight-hour carbon monoxide standards.

In accordance with the conformity guidelines, the Regional Transportation Council (RTC)[3] was consulted regarding conformance of the proposed project with existing transportation and air pollution control plans. The proposed project is *not* included in the existing regional Transportation Improvement Program (TIP) or Metropolitan Transportation Plan (MTP). Once the project is fully defined, it will be included in the regional air quality conformity analysis for both the TIP and the MTP.

[3] *Clark County's Regional Transportation Council is responsible for overseeing regional traffic modeling and air quality conformity.*

The project would reduce conflicts and delays for rail traffic; therefore, trains should spend less time in the study area at idle or low throttle settings, resulting in lowered overall emissions.

For all options, the decrease in train idling would also benefit the air quality in the area.

Alternative I

The potential air quality impacts for Alternative I would be the same as those described above for Alternative B.

Would there be any construction impacts?

Construction effects resulting from either alternative would be short-term. The No Action alternative would have the least effect because there would be no construction. The major air quality effects during construction are expected to be dust, odors, and hydrocarbons.

These are caused by heavy machinery, traffic, and removal and/or placement of materials. Local weather conditions, fuel aromatic content and engine efficiency will affect odor intensity and particulate effects. Construction impacts in the area are expected to be temporary and intermittent only, and they would be diluted at increasing distances from the project.

What mitigation measures are proposed to avoid and/or minimize impacts?

Contract specifications would be written stating that those performing the construction work shall comply with federal, state and local air quality regulations. These regulations cover temporary construction conditions such as dust and smoke emissions. Some of the control measures that should be used to reduce the particulate pollution caused by construction include street sweeping at rail crossings and watering. A dust prevention plan would be developed by the contractor. Since construction would be a temporary condition only, it is anticipated that no other measures would be necessary to control emissions.

No other impacts on air quality are anticipated, therefore no additional mitigation is proposed.

In summary, what impacts would result from the proposed alternatives?

Exhibit 5-7 provides a summary of findings for the air analysis for the **Vancouver Rail Project**.

Water

This section discusses potential impacts and mitigation to water resources. The water discussion is divided into two sections: hydrology (which includes surface water, water quality, and groundwater) and floodplains.

Air—Summary of Potential Impacts*

Exhibit 5-7

ALTERNATIVE	IMPACT	EXPLANATION
Alternative A	-	Increased vehicle emissions associated with increased vehicle delays. Continued train idling and associated emissions
Alternative B		
Option 1	+	Decreased train emissions due to decreased idling
Option 2	+ -	Same as Alternative B, Option 1 Increased vehicular emissions on other roadways
Option 3	+ -	Same as Alternative B, Option 1 Same as Alternative B, Option 2
Alternative I		
Option 1	+	Decreased train emissions due to decreased idling
Option 2	+ -	Same as Alternative I, Option 1 Increased vehicular emissions in on other roadways
Option 3	+ -	Same as Alternative I, Option 1 Same as Alternative I, Option 2

**Does not include construction impacts*

Hydrology

Potential impacts for surface water, water quality and groundwater are discussed in this section. Construction impacts and proposed mitigation follow the impacts discussion.

Are there any potential impacts to hydrological resources?

Hydrological impacts are discussed by alternative.

Alternative A (No Action)

Alternative A would not result in any changes to the existing configuration of railbed and track, nor would it have any effect on water quality in the project vicinity. Therefore, there would be no change to the existing hydrological resources in the study area.

Build Alternatives

Both action alternatives, Alternatives B and I, are identical with regard to potential physical impacts to hydrological resources in the study area. The only potential difference between the alternatives is in the amount of stormwater generated from new impervious surfaces created by the bridge alternatives (Alternative B – Option 1 and Alternative I – Option 1).

Alternative B

The **Vancouver Rail Project** is primarily contained within existing railroad right-of-way. This alternative does not include any improvement to passenger facilities such as terminals or parking lots; therefore there would be little change in the amount of existing impervious surface area. Although groundwater under the rail

yard vicinity may have been historically contaminated, actual sources of contamination have yet to be determined. The improvement, as an upgrade of the existing system; should have little effect on the existing conditions, or water quality in the rail yard vicinity.

However, hydrologic impacts could occur in two areas: in the vicinity of Burnt Bridge Creek, and the area around West 39th Street. Construction in the vicinity of Burnt Bridge Creek would entail the construction of a retaining wall at the toe of the existing railbed slope. The 2,000-foot retaining wall would be installed on the west side of the existing railbed, and extend approximately seven hundred feet north and 1,300 feet south of the Burnt Bridge Creek culvert. The retaining wall would be built flush with the existing culvert wing walls on the creek, and neither modification of the culvert nor in-water work would be required. The retaining wall would be backfilled from the track side.

The area north of Burnt Bridge Creek along Vancouver Lake includes young mixed hardwood and submature cottonwood vegetation types. Some trees would be removed to widen the railbed and build the retaining wall or fill slope. Additionally, access road construction would result in some tree removal. Tree removal could slightly decrease stormwater infiltration, thereby increasing runoff to the lake and/or creek. This could result in a potential increase of peak flows and an overall temporary increase in drainage network density. However, areas to be cleared are relatively small and no significant impacts to hydrology or the area are anticipated. Most importantly, the culvert at Burnt Bridge Creek would not be affected by the improvement. Additionally, best management practices, including re-vegetation of the area, would be implemented to minimize any potential for adverse impacts to Vancouver Lake and Burnt Bridge Creek.

Stormwater issues would be examined closely during final design. Increases in impervious surface would be negligible, with the changes mainly occurring at West 39th Street.

Activities in the vicinity of West 39th Street would occur along approximately 1,500 feet of West 39th Street and up to eight hundred feet of Northwest Cherry Street. Both alternatives would alter runoff in these areas by replacing pervious with impervious surfaces. Such runoff would enter existing storm sewers for eventual conveyance to the Columbia River.

Alternatives B and I differ in the exact amount of new impervious area that would be created, as shown in **Exhibit 5-8**, but both Alternatives would create new impervious area in the vicinity of West 39th Street and Northwest Cherry Street. Alternatives B and I-1 would require rerouting eight hundred feet of Northwest Cherry Street, creating 19,200 square feet of new impervious area that would eventually drain to the Columbia River. Alternatives I-2 and I-3 would reroute much less of Northwest Cherry Street, requiring only 3,168 square feet of new pavement. Alternatives B-1 and I-1, which replace West 39th Street with a bridge, would add 17,880 square feet of pavement to the West 39th Street corridor. The other Alternatives, which close West 39th Street entirely or maintain only a foot/bicycle bridge, would create only 2,998 (bridge) or 1,750 (full closure) square feet of new impervious area.

New Impervious Areas Created (square feet) Alternatives B and I
Exhibit 5-8

ALTERNATIVE	NEW IMPERVIOUS AREA ALONG WEST 39TH ST ALIGNMENT	NEW IMPERVIOUS AREA DUE TO NORTHWEST CHERRY STREET REROUTING	TOTAL NEW IMPERVIOUS AREA
B, Option 1	17,880	19,200	37,080
B, Option 2	1,750	19,200	20,950
B, Option 3	2,998	19,200	22,198
I, Option 1	17,880	19,200	37,080
I, Option 2	1,750	3,168	4,918
I, Option 3	2,998	3,168	6,166

Standard railroad designs would be used in constructing the track improvement. Areas where slopes are to be cut would be reseeded and permanently stabilized as per the Washington State Department of Ecology's (WDOE) specifications.

Stormwater on non-bridge track structures would remain on the track structure. The track structure is kept pervious with crushed rock ballast, designed to allow precipitation to drain from the track structure into the subballast, soil and groundwater. Any physical improvement would be designed to meet standard engineering practices to prevent impacts to water resources.

Excess water from sources located off of the right-of-way is also handled by standard practices. This water is usually channeled away from the elevated tracks by ditches paralleling the track structure. Culverts are placed at regular intervals to allow this water to drain to the lower side, thus allowing the water to continue its migration to the lowest point. Thus rail operations, in general, have been mitigated through standard engineering design and maintenance practices.

Alternative I

As discussed above, Alternative I would create additional impervious areas. Alternative I-1 would require rerouting eight hundred feet of Northwest Cherry Street, creating 19,200 square feet of new impervious area that would eventually drain to the Columbia River. Alternatives I-2 and I-3 would reroute much less of Northwest Cherry Street, requiring only 3,168 square feet of new pavement. Alternative I-1 (like Alternative B-1), would replace West 39th Street with a bridge, and therefore would add 17,880 square feet of pavement to the West 39th Street corridor. The other Alternatives, which close West 39th Street entirely or maintain only a foot/bicycle bridge, would create only 2,998 (bridge) or 1,750 (full closure) square feet of new impervious area.

The potential hydrological impacts of Alternative I with respect to stormwater management, NPDES, Endangered Species Act, would be the same as those for Alternative B described in the preceding section.

Would there be any construction impacts?

In order to construct the retaining wall, temporary access roads would be built north and south of the construction site. No equipment would enter the lake or creek. In the absence of erosion control measures, described below, construction of the

retaining wall and associated access roads could deliver sediment to Burnt Bridge Creek (below the culvert) and Vancouver Lake. Construction of the retaining wall would not affect channel hydrology.

The erosion and sedimentation potential is generally low for railroad construction. This is because the existing right-of-way is already maintained by the railway. The additional improvement work includes extending the placement of subballast and ballast materials on existing compacted, stabilized surfaces. These surfaces are stable and compacted through use as the right-of-way.

In addition, when compared to most construction projects, the actual construction time for a typical railroad improvement is very fast. Railway companies often use specialized track-based equipment to deposit ballast, and to lay ties and track. This equipment allows them to lay track segments in a few days, limiting exposure of open soil. Even in places where cuts or fills are needed, open exposed soils are quickly capped either with subballast and ballast materials during the laying of the track structure, or during final slope stabilization, which includes hydroseeding as a normal part of railroad construction operations.

Potential water quality impacts could occur if disturbed soils are not properly cared for and proper erosion control methods are not undertaken. Since the site is relatively flat and since the majority of the construction occurs away from potentially affected surface water bodies, the potential for surface water impacts is low. Special consideration will still be afforded construction near the identified sensitive areas at Burnt Bridge Creek and associated wetlands. A detailed temporary sedimentation and erosion control plan will be developed for this project that will identify specific erosion control techniques for use at this site. Special care to limit incursions into the sensitive areas has been done during the preliminary design process for this project.

The nature of crushed rock ballast allows water to infiltrate, while keeping mud and sediments from fouling the tracks. Thus, railroad track structures do not impact stormwater infiltration. The only impervious structures are the tracks and ties, which are also placed on ballast. These are minor parts of the overall track structure and thus any excess water from these areas flows from the ties and tracks into the surrounding ballast and is absorbed into groundwater. Generally, surface hydrology will not be changed by implementation of either alternative. However, construction activities which may temporarily increase impervious surface include clearing vegetation, re-grading the existing ground surface, handling construction materials, and operating machinery.

Construction activities have a potential to introduce pollutants into surface waters including sediment, fuel, and lubricants. Nutrients from seed mixtures applied for stabilizing soil have the potential to reach adjacent water resources. Depending upon the nature of the contractor's operation, staging areas may be used for the fueling and maintenance of vehicles and machinery, temporary storage of hazardous materials, and waste accumulation. There is the potential to adversely impact water quality if these activities and/or materials are exposed to stormwater.

As with all construction, there may be a potential for hazardous materials to be spilled on the construction job-site. Although this is an unlikely possibility, The Burlington Northern and Santa Fe Railway Company has a well-established emergency response program for accidental releases. This program is also initiated when a previously unknown hazardous materials site is uncovered during construction of facilities.

Clearing and grading activities in the vicinity of the identified surface water bodies have the potential to impact surface water quality. Uncovered or otherwise uncontained soils may erode into surface waters, increasing turbidity. Construction vehicles traveling to and from the site may track mud onto roadways where it will wash into the downstream areas. Construction of the retaining walls near Burnt Bridge Creek has the highest potential for impacts to surface water bodies, because the potentially affected waterways are so close to the construction site.

What mitigation measures are proposed to avoid and/or minimize impacts?

Timing of construction, best management practices, and available sediment and erosion control measures would be used to reduce potential construction impacts.

Structural best management practices (BMPs) would be employed where applicable to prevent runoff from eroding the site. Runoff originating off the site would be diverted, or conveyed through in such a manner as to prevent erosion. Runoff originating on the construction site should be filtered or routed through sediment barriers before being discharged. A geotextile filter fence should be installed whenever an embankment toe is less than one hundred feet flow distance from a water body. Check dams should be installed in steeper drainage ditches to prevent excessive velocities causing erosion.

Stabilization BMPs are used during and after the completion of construction. Any disturbed earth not covered by ballast materials should be planted with grass, mulched, or otherwise covered as soon after earthwork is completed as is practical. Timing of earthwork in relationship to the rainy season is an important factor in determining which stabilization BMPs are appropriate for the improvement. Surface water areas, including wetlands and Burnt Bridge Creek, would be protected from direct impact by constructing retaining walls. These walls would allow for the project to have a smaller footprint than it would with standard two-to-one fills, and could be installed without any temporary fills.

Reseeding must be done early enough in the season to ensure a uniform stand of grass, able to withstand the erosive forces it would be subject to, before the rainy season commences. Other measures such as jute matting, erosion control blanket, or clear plastic covering, would be employed temporarily, until seeding/planting with grasses or other appropriate species is complete. **Exhibit 5-9** describes best management practices to mitigate project impacts.

Best Management Practices Required to Mitigate Project Impacts

Exhibit 5-9

PURPOSE	MEASURE
Avoid Surface Waters	The access roads and wall will be constructed during low lake levels.
	The retaining wall will be backfilled from the track side to avoid equipment operation in the creek drainage.
Erosion Control	Existing roadways or travel paths will be used to access project sites, where feasible. Needed access roads will be constructed to minimize potential for runoff to the creek and lake.
	After construction is completed, the access roads will be obliterated, and the road and construction areas seeded to stabilize the areas.
	The use of heavy equipment and techniques that will result in excessive soil disturbances or compaction of soils will be minimized, especially on steep or unstable slopes.
	Water bars will be constructed on access roads, if needed.
	If needed, erosion control blankets will be installed at the toe of the slope to provide stable equipment working areas.
	Silt fencing and certified weed-free straw bale dikes will be installed between construction areas and surface waters.
	Periodic maintenance of erosion and sediment control measures will be conducted.
	Sedimentation and erosion controls will be implemented (i.e., certified weed-free straw bales, silt fence, de-watering, etc.) on all project sites where equipment or materials are staged or stockpiled to minimize the potential for release of fine sediment into the aquatic environment.
	On steep slopes that are susceptible to erosion, erosion control blankets will be installed to hold seed and soil in place until vegetation is established.
Spill Control	No refueling, storage, servicing, or maintenance of equipment will take place within 150 feet of drainages or other sensitive environmental resources.
	No refueling or servicing will be done without absorbent material or drip pans underneath to contain spilled fuel.
	Any fluids drained from the machinery during servicing will be collected in leak-proof containers and taken to an appropriate disposal or recycling facility.
	Any spills will be cleaned and disposed of properly.
	Under no circumstances will contaminated soils be added to a spoils pile.
Stormwater Management	Stormwater along West 39th Street would be routed into existing city of Vancouver systems.

It is anticipated that any work performed near streams or rivers would be performed under the guidance of the Washington Department of Fish & Wildlife (WDFW), the National Marine Fish Service (NMFS), and the U.S. Fish and Wildlife Service (USFWS) meeting any requirements of the Endangered Species Act (ESA),. No in-stream work is required for the improvement.

Vegetation on the land, if removed, would be replanted following completion construction. Re-vegetation by native species, primarily willow, would provide stability.

Because the overall construction area is greater than five acres, permit coverage under the Washington Department of Ecology (WDOE) NPDES Baseline General Permit would be required. This approval would require the preparation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP would include stabilization and structural best management practices (BMPs). Monitoring requirements specified in the SWPPP would provide a feedback mechanism to ensure that erosion control practices are properly and effectively operating.

As the improvement is along existing right-of-way, it is not anticipated that there would be a need for protection of public sewer or water lines. If these lines do cross under the right-of-way within the improvement area, they will be clearly marked upon engineering plan sheets. The BNSF, contractor or other responsible party would inform the appropriate sewer authority of the proposed construction, and take steps to ensure no damage occurs to lines during the improvement construction.

Floodplains

This section discusses potential impacts to floodplains in the study area. The impacts' discussion is followed by proposed mitigation.

Are there any potential impacts to floodplains?

Floodplain impacts are discussed by alternative.

Alternative A (No Action)

Alternative A would not result in any changes to the existing configuration of railbed and track, nor would it have any effect on floodplains in the study area.

Alternative B

The only area within the study area where potential impacts could occur to floodplains would be in the vicinity of Burnt Bridge Creek. For Alternative B (and Alternative I) the railbed in the vicinity of Burnt Bridge Creek would be widened by constructing a retaining wall at the toe of the existing railbed slope. The 2,000-foot retaining wall would be installed on the west side of the existing railbed, and extend approximately seven hundred feet north and 1,300 feet south of the Burnt Bridge Creek culvert. The retaining wall would be built flush with the existing culvert wing walls on the creek, and neither modification of the culvert nor in-water work would be required. The retaining wall would be backfilled from the track side.

The construction of this retaining wall in the 100-year floodplain could affect base flood elevations and the recession of flood waters if the normal drainage pattern were altered or if the drainage were impeded. However, significant changes to the floodplain are not anticipated because the proposed project would not result in the loss of existing floodplain.

Construction of the retaining wall would remove vegetation on the affected slope. Other than stabilizing the slope, this non-native vegetation does not provide any floodplain function. Replacement of this vegetation with a retaining wall would

result in a negligible reduction of floodplain area and function. The retaining wall footprint would occupy less than a third of an acre.

The proposed project would not contribute to increased runoff affecting the floodplain. Increases in impervious surfaces would be negligible because the new surface area created in the area of the 100-year floodplain would consist of track ballast, which is a highly pervious material. The existing culvert lies within the Federal Emergency Management Administration's (FEMA) 100-year floodplain. Since no additional restriction of flow would occur, the proposed project would not increase the risk of flood hazard to the area.

Alternative I

The potential floodplain impacts of Alternative I would be the same as those described above for Alternative B.

Would there be any construction impacts?

No temporary construction impacts to the Burnt Bridge Creek floodplain would occur.

What mitigation measures are proposed to avoid and/or minimize impacts?

The retaining wall would not significantly affect the floodplain, so no mitigation would be required.

In summary, what impacts would result from the proposed alternatives?

Exhibit 5-10 provides a summary of findings for the water analysis for the **Vancouver Rail Project**.

Water—Summary of Potential Impacts*

Exhibit 5-10

ALTERNATIVE	IMPACT	EXPLANATION
Alternative A		No impacts
Alternative B		
Option 1	-	Slightly increased stormwater volumes
Option 2	-	No impacts
Option 3	-	Slightly increased stormwater volumes
Alternative I		
Option 1	-	Slightly increased stormwater volumes
Option 2	-	No impacts
Option 3	-	Slightly increased stormwater volumes

**Does not include construction impacts*

Plants and Animals

This discussion presents an overall review of potential impacts to plant and animal resources. This analysis includes review of wildlife, vegetation, fisheries and wetlands. Mitigation measures that could avoid or minimize potential impacts follow this discussion.

Wildlife and Vegetation

Combined potential impacts for wildlife and vegetation are discussed in this section. Construction impacts and proposed mitigation follow the impacts discussion.

What potential impacts would the proposed alternatives have on wildlife and vegetation?

Impacts are discussed by alternative.

Alternative A (No Action)

No new impact to vegetation, wildlife, or Threatened, Endangered, or Special Status (TES) species is expected to occur under the No Action Alternative.

Alternative B

Alternatives B-1, B-2, B-3, and I-1 would clear 0.44 acres of ruderal vegetation to realign 800 feet of the street. Alternatives B-2 and B-3 would clear 0.07 acres of ruderal vegetation to realign 132 feet of the street (**Exhibit 5-11**).

Alternative B (All Options): Expected Changes in Vegetation Cover

Exhibit 5-11

VEGETATION TYPE	ACRES TO BE CLEARED
Ruderal (grass and shrub habitat)	30.69
Young Mixed Hardwood (Shrub habitat)	2.32
Submature Cottonwood (young forest habitat)	3.91
Mixed Mature (forest habitat)	0.04

Ruderal vegetation consists primarily of nonnative weeds, such as Himalayan blackberry. The loss of ruderal vegetation represents a minor environmental impact. If mitigation measures replace ruderal vegetation with native vegetation, it represents a beneficial impact.

The remaining clearing would remove 6.27 acres of woody vegetation including: 2.32 acres of young mixed hardwood species (shrub habitat), 3.91 acres of young cottonwood trees (young forest habitat) and 0.04 acres of larger trees (forest habitat). These areas are primarily composed of native tree species and mixed with native and nonnative shrub species. The most abundant nonnative species of shrub is Himalayan blackberry.

The loss of these 6.27 acres of woody vegetation would result in some fragmentation and net loss of habitat in the project area, accompanied by a loss of structural and species diversity within plant communities. This impact is necessary because the applicant requires, as a safety measure, to keep areas near the rail lines

free of trees to allow adequate sight distance for personnel operating and maintaining trains and facilities in the study area.

Vegetation clearing would not be significant on a regional scale. The ruderal plant community contains very common species, some of which (such as crab grass and Himalayan blackberry) are regarded as undesirable weeds. The woody vegetation types identified in the study area are common vegetation types in western

Washington, and these particular areas are not known to provide habitat for any Threatened or Endangered plant species.

The one area where adverse impacts could be locally significant is in the vicinity of Vancouver Lake and Burnt Bridge Creek. This area includes ruderal, young mixed hardwood, and submature cottonwood vegetation types. Each of these vegetation types occurs (1) near the shoreline of Vancouver Lake, (2) near Burnt Bridge Creek, and (3) near one or more of the four wetlands identified in the area (Wetlands W1, E1, E2, and E3). These forest communities are sensitive because they occur within the shoreline management zone of Vancouver Lake and Burnt Bridge Creek, and/or within wetland buffers. Each of these habitats is recognized as sensitive. A total of 0.17 acres of shrub vegetation will be cleared within the identified buffers of these sensitive areas. The City of Vancouver Wetlands Protection Ordinance (Chapter 20.50) classifies wetlands and assign buffer widths based on wetland quality and type of buffer vegetation. The project has been designed to avoid direct impacts to wetlands, and will result in a very small area of buffer vegetation impacts.

Alternative B (All Options): Potential Impacts to Wildlife

Exhibit 5-12

SPECIES	POTENTIAL IMPACT
Bald Eagle	Disturbance from construction
Myotis (Bats)	Disturbance from construction and loss of habitat (submature cottonwood)
Western Pond Turtle	Incidental disturbance of habitat
Pileated Woodpecker And Lewis' Woodpecker	Reduction of habitat (submature cottonwood)
Gray Tailed Vole	Loss of individuals and habitat (ruderal)
White-Breasted Nuthatch	Removal of 5.27 acres of forested habitat
Purple Martin	Removal of 7.71 acres of forested habitat (submature cottonwood and mixed mature)
Northern or Brush Prairie Pocket Gopher	Loss of individuals and ruderal habitat
Red-Tailed Hawk	Reduction of foraging habitat (ruderal) and potential nest sites (submature cottonwood)
Cavity-Nesting Ducks, Great Blue Heron	Disturbance from construction
Great Blue Heron	Human activity and encroachment
Osprey	Disturbance from construction
Waterfowl, Regular Concentrations	Disturbance from construction
Songbirds, Small Mammals	Removal of 5.27 acres of forested and 30.32 acres of ruderal habitat
All Species	Noise from increased rail service

Wildlife and Habitat Impacts

Potential impacts to wildlife would result from habitat removal, as discussed in the previous section. The species likely to be impacted the most would be those that rely on young mixed hardwood and submature cottonwood forests. Some species will be impacted more than others, as described in **Exhibit 5-12.**

Threatened and Endangered Species Impacts

Bald eagles are the only terrestrial federally listed threatened and

endangered species that may occur within the study area (federally listed fish species are addressed in the Fisheries section of this document). Bald eagles are known to forage, roost and nest along the forested shoreline of Vancouver Lake. A nest site was occupied within ¼ of a mile of the site prior to 2000. Surveys conducted in the spring of 2000 by the WDFW revealed that the nest was no longer present, and no rebuilding of the nest has been observed. According the WDFW biologists, active foraging and roosting areas for the Bald Eagle are primarily located on the west side of Vancouver Lake and are more associated with the flowing water of the Columbia River. If the previously used nest site remains inactive at the time of construction, no impact is expected. If the nest site is reestablished and is active, potential disturbance to nesting bald eagles will occur during construction activities (**Exhibit 5-12**). Wintering eagles could be affected by noises generated by the pile driving activities associated with retaining wall construction. Pile driving work could be restricted to limit potential impacts to wintering Bald Eagles. None of the habitat alteration activities should affect Bald Eagles since they do not use the habitats affected, and because prey species should also not be affected. No other activities associated with the project are expected to affect these species.

Alternative I

As noted above, the potential vegetation impacts of Alternatives B and I are practically identical. The alternatives differ in the area of ruderal vegetation to be removed, due to differences in the length of the Northwest Cherry Street realignment. Alternative I-1, like Alternatives B-1, B-2, and B-3, would clear 0.44 acres of ruderal vegetation to realign 800 feet of the street. Alternatives I-2 and I-3 would clear 0.07 acres of ruderal vegetation to realign 132 feet of the street. **Exhibit 5-13** presents the potential impacts of Options 2 and 3 to vegetation cover. There is also a slight decrease in the amount of young mixed hardwood shrub habitat that will be affected by the westerly bypass in areas south of West 39th Street. Alternative I will result in 1.32 acres of impact (1 acre less than Alternative B) to shrub habitat. **Exhibit 5-14** presents the potential impacts of vegetative cover in wetland buffer areas and wildlife habitat.

Alternative I (Options 2 and 3): Expected Changes in Vegetation Cover

Exhibit 5-13

VEGETATION TYPE	ACRES TO BE CLEARED	ACRES TO BE REVEGETATED	ACRES TO REMAIN UNVEGETATED	VEGETATION TYPE AFTER REVEGETATION
Ruderal	30.32	11.74	18.58	Nonforest[1]
Young Mixed Hardwood	1.32	1.32	0	Nonforest[1]
Submature Cottonwood	3.91	2.47	1.44	Nonforest[1]
Mixed Mature	0.04	0.00	0.04	Nonforest[1]

[1]Nonforest vegetation composition and structure would be determined according to mitigation measures described in Section 6 of this report and in the Wetlands Discipline Report.

Will there be any other construction impacts?

Areas of plant communities affected were calculated by assuming that a given construction activity would entail clearing vegetation for a given width from the track centerline, with each side of the centerline calculated separately. Construction activities and their corresponding widths of clearing are shown in **Exhibit 5-15**.

Vegetation Comparison of Build Alternatives

Exhibit 5-14

	ALTERNATIVE	ACRES TO BE CLEARED
Ruderal	B	30.69
	I	30.32
Young Mixed Hardwood	B	2.32
	I	1.32
Submature Cottonwood	B	3.91
	I	3.91
Mixed Mature	B	0.04
	I	0.04

The principal construction impact to vegetation would be its removal. This is a permanent impact and as such is discussed in the mitigation section.

Construction impacts to wildlife could occur if construction took place during the breeding season. Species whose breeding or rearing could be disturbed by construction include bald eagle, pocket gopher, red-tailed hawk, cavity-nesting ducks, great blue herons, and other waterfowl. Mitigation measures presented below would reduce these impacts to insignificance.

What mitigation measures are proposed to avoid and/or minimize impacts?

Mitigation is discussed in terms of vegetation and wildlife. Vegetation is divided into non-sensitive and sensitive area.

Some areas cleared of vegetation would remain free of vegetation where covered by railroad structures, including tracks, ballast, retaining walls, permanent staging areas, signals, etc. The remaining cleared areas would be replanted with a seed

Classes of Construction Activity and Associated Clearing Widths

Exhibit 5-15

CONSTRUCTION ACTIVITY	CLEARING WIDTH (FEET)
Northwest Cherry Street realignment	24
Single new track	25
Double new track	45
Switch or crossover on single new track	45
Switch or crossover on double new track	65
Retaining wall up to 50 feet from track centerline on single new track	60
Retaining wall up to 50 feet from track centerline on double new track	80
Retaining wall 200 feet from track centerline on single new track	210
Retaining wall 200 feet from track centerline on double new track	230

mixture intended to stabilize the soil and encourage the growth of native plants. A mitigation plan would be prepared to incorporate best management practices (BMPs) employed by WSDOT for establishment of stable native nonforest vegetation communities in rights-of-way. The long-term success of such measures is uncertain. The affected areas would remain exposed to bright sunlight, and seeds supplied by adjacent plant species located outside the right-of-way would potentially seed the area. Thus, it is possible that woody vegetation would become reestablished in the right-of-way within a few years.

Mitigation measures for nesting bald eagles will be applied only if the nest is active. If the nest is active, then no construction activity will occur within ¼ mile of the nest during the nesting season which is generally defined as the period from January 1 through August 15th. Verification of nest occupancy will be conducted prior to construction, and consultation with a WDFW biologist will be required. Through consultation[4], timing and distance buffers can be adjusted. Mitigation measures for wildlife are presented in **Exhibit 5-16**.

Wetlands

Potential impacts to wetlands are discussed in this section. Construction impacts and proposed mitigation follow the impacts discussion. **Appendix B** presents mapping which illustrates wetland locations and types within the study area.

Are there any potential impacts to wetlands?

Wetlands impacts are discussed by alternative.

Alternative A (No Action)

Alternative A would not result in any changes to the existing configuration of railbed and track, nor would it have any effect on wetlands in the project vicinity. Therefore, there would be no effect on the wetlands.

Alternative B

Both action alternatives are identical with regard to potential wetland impacts. Neither alternative would directly affect wetlands or streams. Proposed improvements common to both alternatives include four components adjacent to the wetlands in the north segment of the project area:

- crossover between existing tracks adjacent to Wetland E3 and associated access platform;
- crossover and siding extension adjacent to Wetland E2;
- new NP siding extension west of the existing tracks adjacent to Wetland W1; and
- realignment of existing curves east of the existing tracks adjacent to Wetland E1.

[4] *A Biological Assessment for eagles was prepared by the project team and a finding of "no effect for eagles" was determined through the evaluation.*

Potential Mitigation Measures for Wildlife Habitat

Exhibit 5-16

SPECIES	IMPACT	POTENTIAL MITIGATION
BALD EAGLE	Disturbance from construction	No construction activity within 1/4 mile of an active screened nest (January 1 to August 15), unless individual consultation with a WDFW biologist determines the distance or timing buffer can be reduced
MYOTIS (BATS)	Disturbance from construction and loss of habitat (submature cottonwood)	No clearing during breeding season (August to November)
WESTERN POND TURTLE	Incidental disturbance of habitat	Clearly mark all wetland buffers, and have a wetland biologist inspect buffers before and after clearing
PILEATED WOODPECKER AND LEWIS' WOODPECKER	Reduction of habitat (submature cottonwood)	Retain large trees and snags (submature cottonwood and mixed mature)
GRAY TAILED VOLE	Loss of individuals and habitat (ruderal)	None
WHITE-BREASTED NUTHATCH	Removal of 5.27 acres of forested habitat	Enhance remnant habitat
PURPLE MARTIN	Removal of 5.27 acres of forested habitat (submature cottonwood and mixed mature)	Retain large trees and snags with cavities (submature cottonwood and mixed mature)
NORTHERN OR BRUSH PRAIRIE POCKET GOPHER	Loss of individuals and ruderal habitat	Avoid ground disturbance during rearing season (March-July).
RED-TAILED HAWK	Reduction of foraging habitat (ruderal) and potential nest sites (submature cottonwood)	If possible, limit clearing to outside of breeding season (February-May), survey for nest trees, conduct cooperative planning with WDFW
CAVITY-NESTING DUCKS, GREAT BLUE HERON	Disturbance from construction	Develop a clearing schedule in cooperation with WDFW and the local jurisdictions
GREAT BLUE HERON	Human activity and encroachment	Regulate timing in wetland areas
OSPREY	Disturbance from construction	None
WATERFOWL, REGULAR CONCENTRATIONS	Disturbance from construction	Regulate timing in wetland areas
SONGBIRDS, SMALL MAMMALS	Removal of 5.27 acres of forested and 30.25 acres of ruderal habitat	Enhance remnant habitat (ruderal and submature cottonwood)
ALL SPECIES	Noise from increased rail service	None

Wetlands and their buffers identified in the study area have been or are presently being impacted by construction and operation of the existing railroad system. These wetlands were fragmented and partially filled at the time of railroad construction, which occurred decades ago. Existing wetland functions are being impacted by railroad operations and on-going right-of-way maintenance. The proposed improvements would not result in additional fragmentation of wetland or upland habitats. The proposed action is also not expected to alter existing hydrologic regimes in adjacent wetlands or wetland functions related to food web support, groundwater exchange, or water quality.

The rail yard has long been a neighbor to the Vancouver community

No wetlands will be filled. Wetland buffers will also be preserved. The existing railroad embankment will not be widened for this project in the vicinity of wetlands or their buffers. Instead, retaining walls will be constructed within the footprint of the existing embankment to provide the necessary platform for the new facility. One small area (0.17 acres) that is within the 300-foot wetland buffer of Wetland W-1 will be cleared for the proposed facility. The buffer area will be revegetated.

There should be no permanent impacts to the identified wetlands, and the wetland buffers will still function as they do now.

Alternative I

Alternative I would have the same potential wetlands impacts as Alternative B, described above. **Exhibit 5-17** summarizes wetland and wetland buffer impacts for both alternatives.

Wetland and Wetland Buffer Impact Summary

Exhibit 5-17

WETLAND NAME	WETLAND IMPACT	BUFFER IMPACT
E-3	None	0.04 acres
E-2	None	0.10 acres
W-1	None	1.30 acres
E-1	None	0.03 acres
Total	**None**	**1.44 acres**

Would there be any construction impacts to wetlands?

Construction activity may cause temporary impacts to wetlands and/or their buffers. These impacts could include increased erosion/sedimentation due to clearing and grading and releases of hazardous materials from accidental spills. Best management practices (BMPs) would be implemented during construction to avoid and minimize temporary impacts.

What types of mitigation would be used to avoid and/or minimize impacts?

The project design has included retaining walls and careful construction access planning to limit direct impacts to wetlands and their buffers. The retaining walls would hold up the railbed and keep any fill from entering the waterbody. Constructing these walls could also be done without direct or temporary fill in wetlands.

Wetland E3 is located in the City of Vancouver. These two jurisdictions have adopted ordinances that are largely the same. Under these ordinances wetlands and their buffers are protected resources and impacts to these resources require a wetland permit. Wetland permit applications shall be based upon an enhancement/mitigation plan that satisfies the following general requirements:

- The proposed activity should not cause significant degradation of groundwater or surface-water quality or fish and wildlife habitat;
- The proposed activity should comply with all state, local, and federal laws, including those related to sediment control, pollution control, floodplain restrictions, stormwater management, and on-site wastewater disposal;
- Wetland buffer impacts should be minimized; and
- Adjusted wetland buffer widths should be determined by the jurisdictional department in accordance with the buffer rating system and adjustment factors identified in the ordinance.

The ordinances allow for buffer width reduction via buffer averaging and enhancement. Temporary impacts associated with construction activities would be mitigated by implementing best management practices. Such best management practices could include:

- using erosion control measures such as filter fabric, straw bales, or other sediment barriers to prevent sediments from reaching wetlands and streams;
- hydroseeding and/or replanting all denuded soils following temporary clearing and grading;
- delineating clearing limits with orange construction fencing to prevent inadvertent clearing in sensitive areas; and
- avoiding vehicle refueling and maintenance within buffer areas of wetlands and streams.

All mitigation measures are summarized in **Exhibit 5-18**.

Best Management Practices to Mitigate Project Impacts

Exhibit 5-18

PURPOSE	MEASURE Within the buffer areas between wetlands and the railroad grade:
Mitigate Temporary Construction Impacts	• Use erosion control measures such as filter fabric, straw bales, or other sediment barriers to prevent sediments from reaching wetlands and streams. • Hydroseed and/or replant all denuded soils following temporary clearing and grading. • Delineate clearing limits with orange construction fencing to prevent inadvertent clearing in sensitive areas. • Avoid vehicle refueling and maintenance within buffer areas of wetlands and streams.
Mitigate Permanent Impacts to Buffers and Their Functions	• Replant buffer areas disturbed during construction. • Hand-clear and plant native plants in buffer areas currently vegetated by nonnative invasive species. • Where it would not affect railroad operations, plant evergreen trees in buffers.

Fisheries

The only fish habitats potentially affected by the **Vancouver Rail Project** are those habitats associated with Burnt Bridge Creek, the two unnamed tributaries north of Burnt Bridge Creek, and Vancouver Lake. For impacts analysis, the study area is defined as the immediate footprint of construction activities.

Are there any anticipated impacts to fisheries?

Fisheries impacts are discussed by alternative.

Alternative A (No Action)

Alternative A would not result in any changes to the existing configuration of railbed and track, nor would it have any effect on aquatic habitats in the project vicinity. Therefore, this alternative would not affect fish or fish habitat.

Alternative B

Alternatives B and I are identical with regard to potential physical impacts to fish habitat. The only potential difference between the alternatives is in the amount of stormwater generated from new impervious surfaces created by the bridge alternatives (Alternative B – Option 1 and Alternative I – Option 1).

The project is not expected to significantly affect stream flows. Railbed ballast is relatively permeable, and should not significantly concentrate runoff. In addition, the project lies at an extremely low position in the watershed, thus any increase in peak flow would have a negligible effect on stream habitat or function. Alternative B – Option 1 and Alternative I – Option 1 both involve the construction of an overpass over the West 39th Street crossing and realignment at Northwest Cherry Street. The impervious footprint of the overpass is expected to be slightly larger than the existing West 39th Street footprint. The net increase in stormwater generated from the overpass is expected to be relatively small (less than one acre). As part of the overpass design, the project engineer would provide additional stormwater detention/ treatment for the project. Stormwater would be routed into existing City of Vancouver systems, which eventually discharge to the Columbia River. The potential for this additional stormwater to affect fish resources is negligible because the net increase in stormwater would be small; additional stormwater would be treated or detained, and the flow volume is discountable when compared to the receiving water (the Columbia River).

Alternative I

The potential impacts of Alternative I to fisheries and fish habitat would be the same as those described above for Alterative B.

Would there be any potential construction impacts?

Potential impacts to fish habitat could occur in the vicinity of Burnt Bridge Creek and Cold Canyon Creek. Retaining wall construction activities will take place near the identified streams, but no riparian vegetation will be affected. The retaining wall would be built flush with the existing culvert wing walls at Burnt Bridge Creek, and neither modification of the culvert nor in-water work would be required. The retaining wall would be backfilled from the track side.

Construction of the retaining wall and associated access roads could potentially result in sediment transport to Burnt Bridge Creek (below the culvert) and Vancouver Lake. However, the construction of the retaining wall would include best management practices to minimize this potential impact.

What mitigation is proposed to avoid and/or minimize potential impacts?

Construction of the retaining walls and other project elements near the identified streams would be subject to appropriate work windows so that potential disturbance of sensitive species could be avoided. Construction segments and schedules may vary according to environmental constraints and the completion of permitting processes. **Exhibit 5.19** on the following page describes best management practices included in the project.

A Biological Assessment[5] was prepared and submitted to NOAA Fisheries. A finding of "may affect, not likely to adversely affect" was agreed upon and the project is subject to conservation measures within that agreement.

In summary, what impacts would result from the proposed alternatives?

Exhibit 5-20 provides a summary of findings for the plants and animals analysis for the **Vancouver Rail Project**.

Plants and Animals—Summary of Potential Impacts*

Exhibit 5-20

ALTERNATIVE	IMPACT	EXPLANATION
Alternative A		No impacts
Alternative B		
Option 1	-	Loss of 6.27 acres of potential habitat Approximately 0.17 acres of low quality wetland buffer will be altered and then re-vegetated
Option 2	-	Same as Alternative B, Option 1
Option 3	-	Same as Alternative B, Option 1
Alternative I		
Option 1	-	Loss of 5.27 acres of potential habitat Approximately 0.17 acres of low quality wetland buffer will be altered and then re-vegetated
Option 2	-	Same as Alternative I, Option 1
Option 3	-	Same as Alternative I, Option 1

**Does not include construction impacts*

[5] *A copy of the Biological Assessment can be obtained from the WSDOT Rail Office.*

Mitigation Measures to Avoid or Minimize Impacts to Fish and Fish Habitat

Exhibit 5-19

PURPOSE	MEASURE
EROSION CONTROL	The access roads and wall will be constructed during low lake levels.
	Existing roadways or travel paths will be used to access project sites, where feasible. Access roads will be constructed to minimize potential for runoff to the creek and lake.
	The retaining wall will be backfilled from the track side to minimize equipment operation in the creek drainage.
	After construction is completed, the access roads will be obliterated, and the road and construction areas seeded to stabilize the areas.
	The use of heavy equipment and techniques that will result in excessive soil disturbances or compaction of soils will be minimized, especially on steep or unstable slopes.
	If needed, erosion control blankets will be installed at the toe of the slope to provide stable equipment working areas.
	Silt fencing and certified weed-free straw bale dikes will be installed between construction areas and surface waters.
	Periodic maintenance of erosion and sediment control measures will be conducted.
	Sedimentation and erosion controls will be implemented (i.e., certified weed-free straw bales, silt fence, de-watering, etc.) on all project sites where equipment or materials are staged or stockpiled to minimize the potential for release of fine sediment into the aquatic environment.
	On steep slopes that are susceptible to erosion, erosion control blankets will be installed to hold seed and soil in place until vegetation is established.
SPILL CONTROL	No refueling, storage, servicing, or maintenance of equipment will take place within 150 feet of drainages or other sensitive environmental resources.
	No refueling or servicing will be done without absorbent material or drip pans underneath to contain spilled fuel.
	Any fluids drained from the machinery during servicing will be collected in leak-proof containers and taken to an appropriate disposal or recycling facility.
	Any spills will be cleaned and disposed of properly.
	Under no circumstances will contaminated soils be added to a spoils pile.

Energy

This section discusses potential impacts to energy. A discussion of construction impacts and potential mitigation measures is also presented.

Are there any potential impacts to energy resources?

Energy impacts are discussed by alternative.

Alternative A (No Action)

Alternative A would not result in any changes to the existing configuration of railbed and track, nor would it have any regional or local effect on the energy use in the study area. However, fuel would continue to be consumed by freight and passenger train operations.

Alternative A would not result in any changes to the existing configuration of railbed and track. Passenger rail traffic would remain at current levels (i.e., eight trains per day), however freight rail traffic is project to increase by 179 percent over 1999 levels. By 2020, 279 freight trains per day are projected to use the study area. Assuming the amount of passenger train delay would increase proportionally with freight traffic, estimated passenger train delay in 2020 would be 28 minutes (or 0.47 hours) per train or a total of 3.76 hours of passenger train delay. Fuel consumed by idling passenger trains would therefore increase to 225.6 gallons per day.[6]

Alternative B

As with other resources, both alternatives are similar with regard to potential impacts to energy use in the study area. The **Vancouver Rail Project** Alternative B would result in more efficient use of the Vancouver rail yard by the existing trains. Efficiencies include less idling, less switching, and less time spent in the yard.

A primary goal of this project is to reduce the existing congestion in the rail system. This would result in an overall decrease in travel time. A portion of the decrease in travel time would be accomplished by decreasing the waiting periods trains currently experience on limited numbers of sidings.

By decreasing the time the trains sit idling on a siding, the project would improve energy efficiency through reduced fuel consumption.

The **Vancouver Rail Project** will result in more efficient use of the Vancouver rail yard. Efficiencies include less idling, less switching, and less time spent in the yard.

A primary goal of this project is to reduce the existing congestion in the rail system. This will result in an overall decrease in travel time. A portion of the decrease in travel time will be accomplished by decreasing the waiting periods trains currently experienced on limited numbers of sidings. By decreasing the time the trains sit idling on a siding, the project may greatly improve energy efficiency through reduced fuel consumption. Fuel use by freight and passenger train operations will

[6] *Direct proportionality between increases in freight traffic and passenger train delays is used for illustrative purposes; actual increases in train delays could be substantially greater than 3.67 hours per day.*

remain the same as Alternative A. However, if operational efficiencies are realized, idling time by passenger trains would be substantially reduced and fuel consumed by idling passenger trains would likewise by reduced. Fuel consumption will decrease at a rate of one gallon per minute of decrease in idle time.

Amtrak passenger rail station in Vancouver

In addition, grade separation of the West 39th Street crossing would result in fuel savings as vehicles would no longer need to idle while trains blocked the crossing.

Alternative I

The potential energy impacts of Alternative I would be the same as those described above for Alternative B.

Would there be any construction impacts?

A temporary increase in energy consumption would occur at the project area during construction. This energy use would include diesel fuel to operate heavy machinery, electrical or gas powered hand tools, and battery or generator electrical lighting and safety signals.

Specialized heavy machinery which is track mounted would be fueled at the BNSF rail yard. These procedures are standard with any track maintenance or improvement. Contractor vehicles and hand held tools would be replenished with local supplies.

What potential mitigation measures could be used to avoid and/or minimize impacts?

Energy impacts resulting from temporary construction would not significantly impact the project area. Sufficient electricity and diesel fuel is available for the energy demand increase due to temporary construction.

Following construction, the project would decrease energy consumption of the trains by reducing the idling time required to move through the yard. Fuel consumption would decrease at a rate of one gallon per minute of decrease in idle time. Similarly, fuel consumption at the West 39th Street grade crossing due to delays would be eliminated by construction of a grade-separated crossing.

In summary, what impacts would result from the proposed alternatives?

Exhibit 5-21 provides a summary of findings for the energy analysis for the **Vancouver Rail Project**. This summary does not include construction impacts.

Energy—Summary of Potential Impacts

Exhibit 5-21

ALTERNATIVE	IMPACT	EXPLANATION
Alternative A	-	Fuel consumption tied to train idling will increase
Alternative B		
Option 1	+	Fuel consumption tied to train idling would decrease; fuel consumption due to vehicle delays at West 39th Street grade crossing would be eliminated.
Option 2	+	Same as Alternative B, Option 1
Option 3	+	Same as Alternative B, Option 1
Alternative I		
Option 1	+	Fuel consumption tied to train idling would decrease; fuel consumption due to vehicle delays at West 39th Street grade crossing would be eliminated.
Option 2	+	Same as Alternative I, Option 1
Option 3	+	Same as Alternative I, Option 1

Environmental Health

This impacts analysis includes a discussion of both noise and vibration and hazardous materials.

Noise and Vibration

Combined potential impacts for noise and vibration are discussed in this section. Construction impacts and proposed mitigation follow the impacts discussion.

Are there any potential noise and vibration impacts?

Noise and vibration impacts are discussed by alternative.

Alternative A (No Action)

Alternative A would not result in any changes to the existing configuration of railbed and track. Trains that sound their horns when crossing West 39th Street would continue to do so, and this noise is expected to increase over time as the existing system becomes more crowded. A projected five percent growth of train demand would also result in more noise along the existing tracks.

Alternative B

Exhibit 5-22 shows that noise impacts are predicted to occur under Alternative B, in the vicinity of Receptor 1. Based on FTA noise impact criteria, the east bypass build option is considered to be an impact, but is not categorized as a severe impact. At this receptor, the noise levels are predicted to be below the WSDOT Monitored noise levels. As modeled, the project will discontinue use of locomotive horns at the nearby grade crossing. However, moving freight traffic onto the proposed siding and allowing it to travel at a speed of 30 mph (rather than the existing speed of 10 mph on the mainline) slightly offsets the discontinued use of locomotive horns.

Under Alternative B, the east bypass project-related noise levels at receptor 2 (Columbia Crest) are predicted to exceed existing noise levels by 2 dB, and to exceed the noise impact threshold at receptor 2. Based on FTA noise impact criteria, Alternative B is considered to be an impact, but is not categorized as a severe impact.

Project-related noise levels are not predicted to exceed the calculated impact threshold at Receptors 3, 4 and 5. Project-related noise levels are also predicted to be below existing noise levels measured by WSDOT and HDR.

Under Alternative B, noise impacts are predicted to occur for the bypass option, in the vicinity of Receptor 6. Based on FTA noise impact criteria, the impact is not classified as a severe impact.

Alternative I

Exhibit 5-22 shows that project-related noise levels are not predicted to exceed the calculated impact threshold at Receptors 1, 3, 4 and 5. Project-related noise levels are also predicted to be below existing noise levels measured by WSDOT and HDR.

Existing and Predicted Noise Levels

Table 5-22

RECEPTOR ID	EXISTING LDN (DBA)	PREDICTED NOISE LEVEL LDN (DBA) ALTERNATIVE B	PREDICTED NOISE LEVEL LDN (DBA) ALTERNATIVE I
1	67	63	59
2	63	65	61
3	78	62	62
4	72	59	55
5	73	62	62
6	70	65	65

Note: The second column in the table presents the monitored Ldn. The third and fourth columns present the predicted Ldn for Alternatives B and I using the FTA methodology.

Under Alternative I, the project-related noise levels at receptor 2 (Columbia Crest) are predicted to be below existing noise levels and to exceed the noise impact threshold at receptor 2. Based on FTA noise impact criteria, Alternative I is considered to be an impact, but is not categorized as severe impacts.

Under Alternative I, noise impacts are predicted to occur in the vicinity of Receptor 6. Based on FTA noise impact criteria, the impact is not classified as a severe impact.

Vibration

The FTA vibration analysis methodology is conservative, and its impacts are admittedly overstated. For example, the locomotive curve represents the upper range of measurement data. This means that although actual levels fluctuate widely, it is rare that ground-borne vibration will exceed the levels in the curve by more than one or two decibels unless there are extenuating circumstances, such as rail corrugations or wheel flats.

A windshield survey of the project area and a review of project mapping were conducted to determine if any residential buildings are located within fifty feet of the proposed bypass track. One residence located at 1901 NW 69th Circle (formerly 6801 Whitney Lane) is located within fifty feet of the bypass build option. No other residences or institutions with primarily daytime use were found to be within fifty feet of the proposed bypass track. Therefore, results of this analysis indicate that one receptor is predicted to potentially experience ground-borne vibration impacts due to the proposed project.

Would there be any construction impacts?

A temporary increase in noise emissions from activities in the Vancouver yard would occur during construction. This increase would be due to use of heavy machinery, electrical or gas powered hand tools, and battery or generator electrical lighting and safety signals.

Specialized heavy machinery, which is track mounted, will also be used at the BNSF rail yard. These procedures are standard with any track maintenance or improvement. Contractor vehicles and hand held tools would also be used. Construction-related noise emissions would be temporary in duration, and would be subject to local construction noise ordinances.

What mitigation measures are proposed to avoid and/or minimize noise impacts?

Feasibility for noise mitigation is based on engineering considerations including the amount of noise reduction, safety factors, and environmental impact. WSDOT Traffic Noise Analysis and Abatement Policy and Procedures include guidelines for noise mitigation. While not a highway project, this project would likely be subject to the WSDOT traffic noise abatement policies. Therefore, noise abatement walls were modeled.

Reasonability criteria are based on the cost of the mitigation, the amount of noise reduction, and future absolute traffic noise levels.

- The noise mitigation cost per residence is calculated by dividing the total mitigation cost by the number of benefiting residences and comparing this cost to the allowances set forth by WSDOT.
- The location of the barriers should not create a negative visual impact.
- The date of development should be considered with at least fifty percent being built before the proposed project.

Receptor 1 Mitigation

Receptor 1 represents two residences located immediately adjacent to the rail right-of-way. These homes are located approximately 180 feet from Alternative B and 240 feet from Alternative I. A noise wall was evaluated along the right-of-way. At the southern-most home, the right-of-way runs east and west, forming the southern property line for this residence. The right-of-way then turns north and forms the western property line for these residences. Assuming a noise wall would be located on the right-of-way, such a wall would have to be built on the southern and western sides of these residences. The wall would be approximately 670 feet long, and would shield Receptor 1 from the proposed siding to the north, west, and south.

The WSDOT reasonability criteria require that mitigation costs be calculated on a cost per affected receptor basis. Assuming a ten-foot wall would be built, the total cost of the wall would be approximately $148, 000, or approximately $74,000 per receptor. Such a wall would not be considered reasonable under the WSDOT noise abatement policy.

Additionally, beyond these two homes the next nearest home is located approximately four hundred feet from the proposed siding. In this part of the study area the terrain slopes upwards from the tracks. Therefore, homes are both farther from the siding and situated at a higher elevation than Receptor 1. Due to both the additional distance and difference in elevation, a wall at the right-of-way is not expected to provide any attenuation for the second row of homes. Therefore, such a wall would not be considered feasible under the WSDOT Noise Abatement Policy.

Receptor 2 Alternative B Mitigation

As stated earlier, a noise impact is predicted for this project for Receptor 2. The mitigation measures outlined below include the construction of noise abatement walls for Alternative B in the vicinity of the Columbia Crest residential development.

For Alternative B, noise abatement walls were modeled in the area of Columbia Crest. Noise mitigation barriers, or noise walls, were modeled along the right-of-way at Columbia Crest to mitigate the noise levels produced by train traffic on the proposed bypass. The modeled barrier breaks the line of sight between the proposed bypass track and the receptors in Columbia Crest, but it does not intersect with the line of sight from the main line tracks.

Modeling results indicate that the contribution of noise from the main line to the receptors is approximately eighteen dB less than the contribution from the proposed bypass track. Therefore noise from the proposed bypass track dominates the overall noise emissions from the Vancouver rail yard (at receptors in Columbia Crest), and reducing noise emissions from the bypass track is expected to result in an overall reduction of noise from the Vancouver rail yard.

Based on this analysis and the WSDOT Traffic and Noise Analysis and Abatement Policies and Procedures, the mitigation model exceeds the feasibility and reasonableness requirements for noise mitigation. The minimum noise reduction requirements of seven dB will be met with the proposed barrier providing nine to ten dB of attenuation at the first row of receptors and 11 dB at the second row of receptors. The noise barrier wall has been modeled at the property right-of-way and will not negatively impact the safety or environment for this development, nor will it create a negative visual impact.

The cost of the mitigation per residence is $12,230. This figure was determined by dividing the Total Wall Cost, $379,148 by the 27 residences in the first row and four residences in the second row. The estimated allowable cost per household based on Table A of the Washington State DOT Traffic Noise Analysis and Abatement Policy and Procedures is $14,000 (this figure assumes there is a linear relationship between design year noise levels and allowable costs per residence in the Washington State DOT Traffic Noise Analysis and Abatement Policy and Procedures). Results of this analysis show the cost per residence is below the $14,000 allowance for the predicted Design Year Traffic Noise Decibel Level of 65 dB. Thus, such a wall is considered feasible under the WSDOT Noise Abatement Policy.

Receptor 2 Alternative I Mitigation

For the proposed westerly bypass, a noise impact is predicted for Receptor 2. The mitigation analysis included evaluation of the terrain features and distances from the source to receptor. The terrain features include a gradual slope of soft ground, approximately two hundred to three hundred feet with a fifty foot rise from source to receptor. Multiple breaks in the line of sight from the source to the receptors occur between the westerly bypass and Columbia Crest residences.

To determine the insertion loss from the terrain, the FHWA and FTA equations for computation of shielding for barriers and terrain were used. Due to the distance from source to receiver (two hundred to 350 feet), this approach was not found to be reliable. Therefore, the Federal Highway Administration's (FHWA) methodology was used to model the insertion loss based on terrain breaks from the source to receiver. Noise walls were modeled to mitigate noise levels to comply with the project related noise impact threshold of sixty dB. Thus, such a wall is considered feasible under the WSDOT noise abatement policy.

The minimum noise reduction requirements of seven dB will be met with the proposed barrier providing seven to twelve dB of attenuation at the first row of receptors and seven dB for at least one second row receptor. The noise barrier wall has been modeled at the property right-of-way and will not negatively impact the safety or environment for this development, nor will it create a negative visual impact.

The cost of the mitigation per residence is $15,683. This figure was determined by dividing the Total Wall Cost, $486,200 by the 27 residences in the first row and four residences in the second row of receivers. The estimated allowable cost per household based on Table A of the Washington State DOT Traffic Noise Analysis and Abatement Policy and Procedures is $8,000 (this figure assumes there is a linear relationship between design year noise levels and allowable costs per

residence in the Washington State DOT Traffic Noise Analysis and Abatement Policy and Procedures). Results of this analysis show the cost per residence is above the $8,000 allowance for the predicted Design Year Traffic Noise Decibel Level of 61 dB. Therefore, this noise mitigation wall is not considered feasible under the WSDOT Noise Abatement Policy.

Receptor 3 Mitigation

Project-related noise levels are predicted to not exceed the calculated impact threshold at Receptor 3. Project-related noise levels are also predicted to be below existing noise levels measured by WSDOT. Therefore, no mitigation is proposed in this area.

Receptor 6 Bypass Mitigation

A noise impact is predicted for this project at Receptor 6. The mitigation measures outlined below include the construction of noise abatement walls for the proposed bypass in the vicinity of Whitney Lane located west of the project area and in the vicinity of NW 69th Circle located to the east.

Under the build condition, a direct line of sight between source and receptor exists both east and west of the project area. Therefore noise abatement walls were modeled using the methodology from FTA Table 6-9. This approach is appropriate because it is intended to evaluate barriers and terrain features that break the line of sight between source and receptors. Receptors were placed in the approximate center of the yards of the first row of homes at a height of five feet above ground (approximately the height of the average human ear).

Noise mitigation barriers, or noise walls, were modeled along the right-of-way to mitigate the noise levels produced by train traffic on the proposed bypasses. The modeled barrier breaks the line of sight between the proposed bypass tracks and the receptors.

WSDOT Traffic Noise Analysis and Abatement Policy and Procedures include guidelines for noise mitigation. While not a highway project, this project will likely be subject to the WSDOT traffic noise abatement policies. Therefore, noise abatement walls were modeled.

A noise wall was modeled to shield the first row of homes located along Whitney Lane to the west of the project area. The modeled wall extends from the Fruit Valley Road overpass on the south to beyond the last home in the first row on the north end. The distance the wall extends to the north beyond the last home was determined using a rule of thumb for modeling highway noise walls. That distance was calculated as being two times the perpendicular distance between the proposed barrier and the receptor.

The minimum noise reduction requirements of seven dB will be met with the proposed barrier providing seven to eight dB of attenuation at the first row of receptors and five dB for at least one second row receptor.

Based on this analysis and the WSDOT Traffic and Noise Analysis and Abatement Policies and Procedures, the modeled noise wall exceeds the feasibility and reasonableness requirements for noise mitigation. The minimum noise reduction requirements of seven dB for at least one first row receptor will be met with the proposed barrier providing 7 to 8 dB of attenuation at the first row of receptors and

five dB at the second row of receptors. The noise wall has been modeled at the property right of way and will not negatively impact the safety or environment for this development, nor will it create a negative visual impact.

The cost of the mitigation per residence is $8,235. This figure was determined by dividing the Total Wall Cost, $131,760 by the 10 residences in the first row and six residences in the second row of receptors.

The estimated allowable cost per household based on Table A of the WSDOT Traffic Noise Analysis and Abatement Policy and Procedures is $14,000 (this figure assumes there is a linear relationship between design year noise levels and allowable costs per residence in the Washington State DOT Traffic Noise Analysis and Abatement Policy and Procedures). Results of this analysis show the cost per residence is below the $14,000 allowance for the predicted Design Year Traffic Noise Decibel Level of 65 dB.

On the east side of the project area, a single residence is located at 1901 NW 69th Circle. Severe noise impacts are predicted to occur at this residence. As with traffic noise mitigation procedures, a noise wall was modeled to shield this residence using the FTA barrier insertion loss methodology. The wall was modeled to be 110 feet in length, extending beyond the home to the north and south to provide adequate shielding. The distance the wall extends beyond the home was determined based on the maximum length of wall allowable under the WSDOT mitigation reasonability criteria. The two times the perpendicular distance between the proposed barrier and the receptor methodology could not be applied in this analysis due the walls close proximity to the residence.

The minimum noise reduction requirements of seven dB will be met with the proposed barrier providing fourteen dB of attenuation at the receptor according to FTA barrier insertion loss methods.

The minimum noise reduction requirements of seven dB will be met with the proposed barrier providing up to fourteen dB of attenuation for the receptor. However, the noise barrier wall has been modeled at the property right of way, which is adjacent to the residence. This may not be an acceptable location for the wall due to its close proximity to the residence.

The cost of the mitigation per residence is $24,310. This cost per residence is below the $24,500 allowance listed in Table A, for the predicted Design Year Traffic Noise Decibel Level of 72 dB. Therefore, this noise mitigation wall is considered feasible under the WSDOT Noise Abatement Policy.

What mitigation measures are proposed to avoid and/or minimize vibration impacts?

As stated above, vibration impacts may occur within fifty feet of the proposed bypass options based on the FTA general vibration analysis methodology. One residence located at 1901 NW 69th Circle is within fifty feet of the east bypass. Available mitigation options for vibration may include isolating the rail, ballast bed or slab. The estimated cost for these mitigation options could be as much as ten times the noise mitigation walls modeled for NW 69th Circle. These costs will therefore most likely exceed the cost per residence that would be considered

reasonable by the WSDOT, therefore structural or source-based treatments are not recommended.

Trenching, a vibration mitigation option recommended by FTA, is a mitigation technique that is analogous to noise walls in that an open trench serves to block the propagation of a pressure wave. In this case, the pressure wave is a ground-borne vibration wave. A relationship between Rayleigh waves presented by FTA, suggests that trench depth should be minimally 0.6 times the Rayleigh wave length below the vibration source. For most soils, FTA claims the Rayleigh waves travel at around 600 feet per second, which means that the wavelength at 30 Hz is 20 feet long. The FTA manual indicates a trench whose depth is approximately 15 feet deep is effective at mitigating vibration waves in the 30 Hz range.

Based on FTA guidelines, a conservative analysis would recommend a 20-feet deep trench, approximately three feet wide. The length of the trench is recommended to be based on the two-times rule of thumb used to estimate noise wall length. For the home on NW 69th Circle, a trench with approximate dimensions of 110 feet long, three feet wide and 20 feet deep was evaluated. This trench has an excavated volume of approximately 6,600 cubic feet (245 cubic yards).

FTA notes that different materials may be used to keep the trench open. Styrofoam, concrete, and metal sheet piles are three examples offered by FTA. HDR evaluated two trench filler options: Styrofoam and bentonite. Styrofoam is compressible, and therefore not an efficient vibration wave conductor. Costs associated with these filler materials are unknown at this time.

Therefore, trenching may be one possible and feasible vibration mitigation option for this home, pending evaluation of BNSF design and safety standards, as well as filler material costs.

Hazardous Materials

Potential impacts related to hazardous materials are discussed in this section. Construction impacts and proposed mitigation follow the impacts discussion.

Are there any potential impacts resulting from hazardous materials?

Hazardous materials impacts are discussed by alternative.

Alternative A (No Action)

Alternative A would not result in any changes to the existing configuration of railbed and track, nor would it have any hazardous materials impacts in the study area.

Alternatives B

In general, the **Vancouver Rail Project** itself would not introduce any new hazardous materials into the study area. Introduction of hazardous materials would take place during construction when the potential for discovering such materials may result.

WSDOT's policy is to avoid contaminated property wherever possible. However, Alternative B would be built by BNSF contractors on their private property; thus WSDOT would not be involved in any property purchase agreements.

The BNSF contractors would be required to meet all federal, state, and local regulatory requirements regarding the discovery and use of hazardous materials on the BNSF right-of-way. The BNSF has strict safety and environmental policies which contractors and employees are required to adhere to while on BNSF right-of-way. BNSF will be responsible for clean-up of all hazardous materials within the project footprint.

Asbestos should not be an issue. If any asbestos is discovered, removal of the asbestos materials must be accomplished in accordance with federal and state standards. The Washington State Department of Labor and Industries regulates asbestos removal and encapsulation. All contractors must be certified in asbestos removal, and their supervisors and laborers must be trained.

Alternative I

The potential hazardous materials impacts of Alternative I would be the same as those described above for Alternative B.

What would be the biggest concerns during construction?

A major construction impact consideration is the potential for creating or modifying contaminant migration pathways. Typically, excavation during construction may expose ground water or clean soil to contamination, spreading contaminants and creating additional liability for cleanup. Fortunately, the nature of railroad construction is very shallow surface construction on existing right-of-way; thus, many of the problems associated with typical construction do not exist.

Hazardous materials construction impacts for rail line projects are caused by two different types of situations. First, the discovery of previously unknown hazardous materials through the construction process, and secondly the impacts the actual construction has on-site. Except as noted, the probability of either situation occurring for this project is low

If a discovery of previously unknown hazardous materials is made during the construction process, the time that would be required to clean-up the waste depends on the type and location of waste. The improvement would be located on the property of The Burlington Northern and Santa Fe Railway Company (BNSF); thus, company procedures for handling hazardous materials would be in effect. The railroad procedures follow current federal, state and local regulations. Depending on the type of hazardous materials, company-authorized personnel may remove the waste and haul it to an appropriate waste disposal site. BNSF would be responsible for all hazardous materials clean-up and mitigation within the project footprint.

Additionally, construction could create an unwanted impact on existing contamination. One of the most undesirable impacts is creating a new migration pathway or otherwise contributing to accelerated migration of existing contamination. It is unlikely that a major spill or leak would be encountered which seeps onto or beyond the railroad right-of-way. If one occurs, the BNSF procedures would be in effect. During construction, the contractor would be responsible to

ensure that any waste materials do not endanger ground or surface waters. BNSF would develop Spill Prevention, Containment and Countermeasures Plans (SPCC), where applicable.

The contractor would prepare a Health and Safety Plan which would define the appropriate engineering control methods and mitigates any potential environmental hazard, and ensure personal protection equipment for the health and safety of workers. Construction should not expose construction crews to any hazards beyond normal construction risks. The contractor would be required to follow the applicable Washington Industrial Safety and Health Administration (WISHA) regulations.

What mitigation measures are proposed to avoid and/or minimize impacts?

The objective of this assessment is to identify and assess those sites that create the greatest liability for WSDOT in acquisition and construction. With appropriate planning, any undiscovered contamination encountered during construction would be identified, isolated, and contained or remediated with minimal cost and schedule impact.

Two sites, the general northeastern vicinity of the Vancouver rail yard and a specific spill within the yard may impact the construction of the improvement. Because information on the two sites may not be complete, the exact nature and extent of these potential hazardous materials sites is unknown.

Because of the surficial nature of typical railroad track bed construction, it is unlikely that any hazardous materials sites would be discovered in the Vancouver rail yard, except for the potential for finding surficial contamination. However, the sites would be located on BNSF property. As such, the BNSF corporate environmental policies and procedures would be implemented if any suspicious signs of contamination were located. Thus, as indicated by the agency files, Initial Site Assessment is not required, since these sites are being delineated and remediated by BNSF.

The purpose for investigating potentially contaminated sites is to avoid or reduce the liability associated with acquiring all or part of such sites and to develop preconstruction documentation for disposal alternatives and worker protection. WSDOT representatives have stated that liability for any existing hazardous materials and or sites found during the construction of this project lies with BNSF. Any future spills would be the liability of BNSF and/or Amtrak, depending on the operator at fault for the spill. WSDOT would have no liability involving hazardous materials issues.

Are there any regulatory requirements?

Numerous federal, state, and local regulations and policies govern decisions concerning hazardous materials potential and liability issues. The Model Toxics Control Act (MTCA) Cleanup Regulation, Chapter 173-340 WAC, is the Washington State implementation of the Model Toxics Control Act, Chapter 70.105D, RCW. The several administrative rules in this regulation include strict requirements for site discovery and reporting, and site assessments. The regulation defines the standard methods used to assess whether a site is contaminated or clean.

Pollution of state waters is controlled by two administrative regulations that implement Chapter 90.48 RCW, Water Pollution Control Act. Chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington. Chapter 173-200, WAC, Water Quality Standards for Ground Water of the State of Washington, contains similar regulations for contamination of ground water, with special emphasis on carcinogens due to the potability of ground water.

Permit requirements for construction projects, where applicable, include several preventive planning methodologies to prevent hazardous materials from spreading, if encountered. These planning tools include the Spill Prevention, Control and Countermeasures Plans (SPCC), Hazardous Waste Contingency Plans, NPDES Stormwater Pollution Prevention Plans (SWPPP) and other Best Management Practices (BMPs).

In summary, what impacts would result from the proposed alternatives?

Exhibit 5-23 provides a summary of findings for environmental health for the **Vancouver Rail Project**.

Land Use

This section discusses the many resources associated with land use and the built environment. Following each impacts section is a discussion of proposed mitigation measures to avoid and/or minimize potential impacts.

Environmental Health—Summary of Potential Impacts*
Exhibit 5-23

ALTERNATIVE	IMPACT	EXPLANATION
Alternative A	-	Noise from idling trains would continue, as well as noise from train horns at grade-crossings
Alternative B		
Option 1	-	Increased noise from trains using the bypass
Option 2	-	Same as Alternative B, Option 1
Option 3	-	Same as Alternative B, Option 1
Alternative I		
Option 1	-	Increased noise from freight trains using the bypass would impact some nearby residences
Option 2	-	Same as Alternative I, Option 1
Option 3	-	Same as Alternative I, Option 1

**Does not include construction impacts*

Land Use

Potential impacts for land use are discussed in this section. Construction impacts and proposed mitigation follow the impacts discussion.

Are there any potential impacts to land use?

Land use impacts are discussed by alternative.

Alternative A (No Action)

Alternative A would not result in any changes to the existing configuration of railbed and track, nor would it have any effect on the land use in the study area. Therefore, there would be no change to the existing land use of the area.

Alternative B

The railroad is embedded into the community it has served for over one hundred years. The railroad right-of-way width varies, but generally averages approximately 100 to 150 feet north and south of Vancouver rail yard, and 400 to 600 feet wide within the rail yard. Because of its unique use of land, and the long narrow configuration of the property, adjacent land uses have evolved based upon general local land use, not because of the location of the tracks. Local planning agencies have zoned areas accordingly, often after the actual development has occurred.

Because of this scenario, a variety of land uses are adjacent to the rail right-of-way. As local land use evolves into a denser concentration of people and businesses, the local zoning reflects this increased use of the surrounding land. Regardless, the railroad right-of-way has remained a constant on the landscape. However, additional track crossings have been added as development has occurred, and joint use of the rail right-of-way by various utilities has occurred in some locations.

Railroad maintenance and improvement is permitted by all governmental entities along the right-of-way. Because most of this project would be constructed in the existing rail right-of-way, the land use surrounding the right-of-way would not be impacted. The improvement would require relocation of some residential driveways as well as possible residential relocations.

In general, the governing agencies in the locality of the **Vancouver Rail Project** study area are in favor of passenger rail as a way to decrease single occupancy vehicles. The improvement is consistent with adopted transportation and development plans. Many plans encourage the coordination of railway and utilities. No conflicts or inconsistencies with applicable plans or policies are anticipated to occur as a result of Alternative B.

Alternative I

The potential land use impacts associated with Alternative would be the same as those for Alternative B, discussed above.

Would there be any construction impacts?

Construction would occur within existing railroad right-of-way. Track construction, performed on the right-of-way, would not impact other land use any more than routine track maintenance. This is because many of the activities

associated with railroad construction would occur using specially designed track mounted vehicles which lay track structures while on the tracks themselves.

What mitigation measures are proposed to avoid and/or minimize impacts?

Since no impacts to land use are anticipated, mitigation measures are not necessary.

Parks and Recreation (Public Lands)

Potential impacts to parks and recreation are discussed in this section. Construction impacts and proposed mitigation follow the impacts discussion.

Are there any potential impacts to parks and recreation?

Parks and recreation impacts are discussed by alternative.

Alternative A - No Action

The No Action alternative would not result in changes to parks and recreation facilities. However, continued delays at West 39th Street would continue to hamper easy and safe access (via West 39th Street) to parks and recreational facilities on the western side of the railroad tracks.

Alternative B

All options under Alternative B would require the taking of some land from the City of Vancouver's 2.24 acre Heathergate Ridge Park. This designated park[7] is located on a steep, deeply vegetated (mostly blackberries) slope which ends down at the rail tracks. Its boundaries are the rail tracks to the west, a privately owned home to the east, and two privately owned parcels (one on the north (Neal property) and one on the south). There is currently no legal access to this designated parkland.

Alternative B would require acquisition of the property in this area up to the backyards of the homes along NW Dogwood Drive. The project would require cuts into the hillside (at a safe slope) in order to accommodate and additional rail track and a maintenance road (approximately 40 feet into the hillside). The distances of the tracks and the road are based on Burlington Northern and Santa Fe Railway Company (BNSF) safety standards. These current BNSF standards take into account the safety of train crews and maintenance crews. The remaining hillside would be re-vegetated and still appear as an open space.

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[7] *Designated as "Urban Open Space" in Vancouver Urban Parks, Recreation, and Open Space Plan April 2002, Clark-Vancouver Parks and Recreation. Urban open space is defined as – "...provides visual and psychological relief from man-made development within the urban area. Public access via trails and walkways to these areas is also important to provide passive recreational opportunities where it is compatible with resource protection and environmental regulations. When open space areas can be connected along stream corridors, they provide valuable wildlife habitat and other ecological benefits. Urban open space sites may or may not be improved, but can include trails, greenway corridors, community gardens, framed areas, buffers between land uses of differing intensities, such as residential and commercial or industrial activity, and areas within community or neighborhood parks which are left in their natural state."*

Another park parcel, the Vancouver Lake Parcel (tax assessor's number 098363-000), would also be impacted under Alternative B. This 3.47 acre parcel is currently designated as park land as part of the overall Vancouver Lake Park system. This parcel is located on the eastern shores of Vancouver Lake and abuts the railroad track. A culvert to Burnt Bridge Creek is also located in this area. The land is comprised of shoreline and a vegetated (mostly blackberries) slope leading to the tracks. There is currently no legal walking access to this designated parkland. Trespassers walk over the railroad tracks and climb down steep slopes to access this area. The only legal access is via boat.

The project team was in direct contact with the Vancouver-Clark Parks and Recreation throughout the fall of 2002. During this time, the Parks and Recreation Department concluded that these two parcels are not significant per Section 4(f) guidelines, and therefore a Section 4(f) Evaluation was not required[8]. As federal lead agency for this project, the Federal Highway Administration (FHWA) reviewed this information and concurred with this finding. However, WSDOT will continue to work closely with the official of jurisdiction to ensure that the impacts to these two parks are minimized and that appropriate mitigation is designed and implemented. In addition, through this coordination it has been determined that the Vancouver Park Parcel was purchased with State funds which requires as separate conversion and replacement process. WSDOT will work with the Vancouver-Clark Parks and Recreation Department, and other agencies as necessary, to ensure that this conversion process is followed implemented.

Under Alternative B.1 the proposed West 39th Street overpass would provide pedestrian and bike facilities and would increase options for access to recreational facilities to the north and west of the study area.

Alternative B.3 is similar to Alternative B.1. The proposed overpass would create a safer route for bicyclists to access recreational facilities west and north of the study area.

The proposed railroad improvements would occur primarily within the existing railroad right-of-way. None of the alternatives are expected to have significant impacts. However, through the public involvement process, the community expressed concerns about the potential isolation of neighborhoods located west of the rail tracks. Franklin Park, which is located in the northern section of the study area, is located on a bluff overlooking the rail tracks. As such, the majority of the rail activity is over two hundred feet away, resulting in minimal additional impacts to the park.

The vehicular and pedestrian/bicycle overpass alternatives (Alternative B.1, B.3, as well as I.1 and I.3) would mitigate, to varying degrees, the community concerns about isolation by keeping West 39th Street accessible to residents. The Community Resource Team (CRT) has been supportive of these overpass options. While the vehicular overpass would clearly continue to be used, research data indicates that few individuals currently utilize West 39th Street for walking or bicycling. Findings from the analysis do not support the investment for a pedestrian/bicycle-only facility

[8] *See **Appendix F** for this documentation.*

Alternative I

All options under Alternative I would require the taking of some land from the City of Vancouver's 2.24 acre Heathergate Ridge Park. This designated park[9] is located on a steep, deeply vegetated (mostly blackberries) slope which ends down at the rail tracks. Its boundaries are the rail tracks to the west, a privately owned home to the east, and two privately owned parcels (one on the north (Neal property) and one on the south). There is currently no legal access to this designated parkland.

Alternative I would require acquisition of the property in this area up to the backyards of the homes along NW Dogwood Drive. The project would require cuts into the hillslide (at a safe slope) in order to accommodate and additional rail track and a maintenance road (approximately 40 feet into the hillside). The distances of the tracks and the road are based on Burlington Northern and Santa Fe Railway Company (BNSF) safety standards. These current BNSF standards take into account the safety of train crews and maintenance crews. The remaining hillside would be re-vegetated and still appear as an open space.

Another park parcel, the Vancouver Lake Parcel (tax assessor's number 098363-000), would also be impacted under Alternative B. This 3.47 acre parcel is currently designated as park land as part of the overall Vancouver Lake Park system. This parcel is located on the eastern shores of Vancouver Lake and abuts the railroad track. A culvert to Burnt Bridge Creek is also located in this area. The land is comprised of shoreline and a vegetated (mostly blackberries) slope leading to the tracks. There is currently no legal walking access to this designated parkland. Trespassers walk over the railroad tracks and climb down steep slopes to access this area. The only legal access is via boat.

The project team was in direct contact with the Vancouver-Clark Parks and Recreation throughout the fall of 2002. During this time, the Parks and Recreation Department concluded that these two parcels are not significant per Section 4(f) guidelines, and therefore a Section 4(f) Evaluation was not required[10]. As federal lead agency for this project, the Federal Highway Administration (FHWA) reviewed this information and concurred with this finding. However, WSDOT will continue to work closely with the official of jurisdiction to ensure that the impacts to these two parks are minimized and that appropriate mitigation is designed and implemented. In addition, through this coordination it has been determined that the Vancouver Park Parcel was purchased with State funds which requires as separate

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[9] *Designated as "Urban Open Space" in Vancouver Urban Parks, Recreation, and Open Space Plan April 2002, Clark-Vancouver Parks and Recreation. Urban open space is defined as – "...provides visual and psychological relief from man-made development within the urban area. Public access via trails and walkways to these areas is also important to provide passive recreational opportunities where it is compatible with resource protection and environmental regulations. When open space areas can be connected along stream corridors, they provide valuable wildlife habitat and other ecological benefits. Urban open space sites may or may not be improved, but can include trails, greenway corridors, community gardens, framed areas, buffers between land uses of differing intensities, such as residential and commercial or industrial activity, and areas within community or neighborhood parks which are left in their natural state."*

[10] *See **Appendix F** for this documentation.*

conversion and replacement process. WSDOT will work with the Vancouver-Clark Parks and Recreation Department, and other agencies as necessary, to ensure that this conversion process is followed implemented.

As with Alternative B.1, the proposed West 39th Street overpass would provide pedestrian and bike facilities and would increase options for access to recreational facilities to the north and west of the study area.

Alternative I.3, is similar to Alternative I.1, B.1, and B.3. The proposed overpass would create a safer route for bicyclists to access recreational facilities west and north of the study area.

Are any Section 4(f) resources impacted?

Section 4(f) is a section of the United States Department of Transportation (USDOT) Act of 1966. It is a special provision which provides protection to certain publicly used lands and historic sites. Section 4(f) stipulates that the Federal Highway Administration (FHWA) will not approve any program or project which requires the use of any publicly owned public park, recreation area, or wildlife or waterfowl refuge, or a site of any land from an historic site or national, state, or local significance unless:

1. There is no feasible and prudent alternative to the use, and
2. All possible planning to minimize harm resulting from such use is included.

The environmental regulations for applying Section 4(f) to transportation project development can be found at 23 CFR 771.135.

Pursuant to Section 4(f) guidelines, extensive coordination was conducted with the Clark-Vancouver Parks and Recreation Department, the officials which have jurisdiction over this parcel. It has been determined by the City that Heathergate Ridge is not a Section 4(f) resource. This decision was based on the fact that Heathergate Ridge is not a significant park in relation to the overall park system. The park is designated as open space to provide a buffer from the railroad tracks. It's purpose is not to provide passive or recreational community uses.

Would there be any construction impacts?

Construction would occur within existing railroad right-of-way. Track construction, performed on the right-of-way, would not impact parks and recreational facilities any more than routine track maintenance. This is because many of the activities associated with railroad construction would occur using specially designed track mounted vehicles which lay track structures while on the tracks themselves.

What mitigation measures are proposed to avoid and/or minimize impacts?

Since no impacts to parks and recreation facilities are anticipated, mitigation measures are not necessary.

Historic, Cultural and Archeological Resources

Several avenues of research were pursued to identify cultural resource sites potentially affected by the **Vancouver Rail Project**. This included research in the

state archaeology site files, the Washington Heritage Register, the National Register of Historic Places (NRHP), and consultation with staff at the Office of Archeological and Historic Preservation. General Land Office maps and notes for the appropriate townships were examined for evidence of historic structures and/or early historic terrain descriptions. The historical society museum in Vancouver was consulted, as well as archaeologists who had conducted similar investigations within the rail right-of-way in the Vancouver area. Literature relevant to the prehistory and history of the study area was reviewed. **Appendix F** provides information regarding coordination with the Washington State Historic Preservation Officer (SHPO) and their concurrence on the findings of this analysis.

Are there any potential impacts to historic, cultural and archeological resources?

Historic, cultural and archeological impacts are discussed by alternative.

Alternative A - No Action

The No Action Alternative would not result in any physical changes to historic, cultural or archeological resources. However, under the No Build Alternative, it was concluded that the historic resource located at 1901 NW 69th Circle would experience increased noise impacts due to the projected increase in freight rail traffic over next twenty years. Safety issues would also be a considerable factor under the No Build Alternative.

Alternative B

Archaeological survey of the Vancouver study area did not result in the identification of any new archaeological resources in the project area.

However, through Section 106[11] consultation with the State Historic Preservation Office, it has been determined that the residence located at 1901 NW 69th Circle is eligible for the National Register of Historic Places.

Through the Section 106 process, it has been determined that the proposed project alternative(s) would have an adverse effect on the historic property located at 1901 NW 69th Circle due to the configuration of the additional rail line and associated facilities. The proximity of the proposed bypass tracks and access road would necessitate moving the historic building's driveway, as well as installing a retaining wall in front of the building. The retaining wall would be approximately one to two feet high. The driveway would be moved from its current location to approximately 25 feet east closer to the house, and the retaining wall would be installed approximately 35 feet from the primary elevation. The removal of the trees as a result of the retaining wall construction would contribute to the

[11] *Section 106 of the Historic Preservation Act requires that Federal agencies (or projects proposed by others which have federal funding) consider the effects of the proposed project on historic properties. The purpose of this evaluation is to avoid unnecessary harm to historic and archeological resources. The Section 106 process results in a technical report, which is reviewed and approved by the State Historic Preservation Office. Extensive coordination and consultation is also a part of this process. The end product is usually a Memorandum of Agreement (MOA) which outlines proposed mitigation measures designed to protect the historic or archeological resource.*

degradation of the setting. The proximity of the third railroad track (and related facilities) to the building would likely diminish the value of the property and could facilitate a "demolition by neglect," meaning that the property, with lack of residents, would likely deteriorate over time. As part of both build alternatives, a retaining wall would be constructed in this general area. The purpose of the retaining wall is to hold up the new rail access road (typically a filled slope is used; however, that would require more land).

In addition to the findings from the Section 106 analysis, additional potential impacts were identified as part of the NEPA process. Discipline reports were prepared for both natural and built environment resources. These analyses indicated for both Build Alternatives, the historic structure could potentially experience impacts from increased noise (as a result of the proximity of the new bypass tracks) and visual quality impacts. The removal of the trees and construction of the retaining wall would diminish the cultural value of the home's natural setting. No other potential impacts were identified.

Alternative I

Similar to Alternative B, Alternative I would also result in an impact to the historic structure located at 1901 NW 69th Circle.

Are any Section 4(f) resources impacted?

As stated in the previous section, a Section 4(f) evaluation can be performed on a privately owned historic structure. A 4(f) evaluation for an historic resource is required when the resource is on or eligible for the National Register of Historic Places, a physical taking occurs and the Section 106 process results in an "adverse effect" finding. As such, a Section 4(f) evaluation for the residence at 1901 NW 69th Circle was performed. Chapter 9 presents this Section 4(f) documentation.

Would there be any construction impacts?

During construction, ground-disturbing activities could result in the inadvertent discovery of archaeological resources.

What mitigation measures are proposed to avoid and/or minimize impacts?

In the unlikely event that ground-disturbing activities result in the inadvertent discovery of archaeological resources, work would be halted in the immediate area, and contact made with the Washington State Office of Archaeology and Historic Preservation. Work would be halted until such time as further investigation and appropriate consultation is concluded. In the unlikely event of the inadvertent discovery of human remains, work would be immediately halted in the area, the discovery covered and secured against further disturbance. Local law enforcement personnel, the office of the State Archaeologist, and authorized representatives of concerned Indian Tribes would be contacted.

Based on the determination that there are no prudent and feasible alternatives that avoid the 4(f) resource, WSDOT, FHWA, and the SHPO – as part of the Sections 106 and 4(f) processes -- have entered into a Memorandum of Agreement (MOA) which includes measures that wholly or in part mitigate the adverse effects on the historic property.

The MOA states:

"FHWA shall ensure that the following measures are carried out:

I. Documentation

WSDOT shall consult with the SHPO regarding the appropriate level of documentation of the Sutherland House, including but not limited to current view and historic photographs and text. Photo-documentation of the property will occur prior to any project-related disturbance to the site; and

II. Noise barrier and landscaping design

WSDOT shall provide a noise barrier to mitigate increased noise levels resulting from this project and affecting the Sutherland House. As part of the project planning process, WSDOT shall provide the SHPO an opportunity to review and approve preliminary and final designs for the noise barrier, landscaping associated with the noise barrier, vehicle access to the Sutherland House, and other site planning issues that might arise from the undertaking and that may affect the historic character of the Sutherland House. Project plan review and approval by SHPO shall occur at the preliminary and final design stages and at other appropriate stages of the design process as determined by WSDOT."

As the proposed project moves forward, FHWA and WSDOT will continue coordination[12] with the SHPO and the existing property owner.

Social and Economic Factors

The railroad is an integral part of the Vancouver community and the greater corridor it has served for over a century. Communities adjacent to the Vancouver yard and the rail corridor currently experience noise, vibration, aesthetic disruptions and delays at rail crossings as a result of their proximity to the rail yard and tracks. It is unlikely that changes in baseline socioeconomic conditions would occur as a result of the **Vancouver Rail Project**.

Community Cohesion

Through the public involvement process for the **Vancouver Rail Project**, members of the study area community raised concerns about the project-related socioeconomic effects as they pertain to the stated objectives in their neighborhood plans.

The community expressed concerns about degradation of neighborhood aesthetics and quality of life. The specific community concerns cited during the six-month Community Resource Team (CRT) process included opposition to tree removal; emergency access concerns; concerns about rail crossing safety (trespassing) even

[12] ***Appendix B*** *presents copies of correspondence with the State Historic Preservation Office (SHPO). Beginning in December 2001, the WSDOT project team has been working closely with the SHPO to determine the impacts of the* ***Vancouver Rail Project*** *on this historic structure. In addition, through the public involvement process, the project team has been in close contact with the property owner.*

in a closure scenario; distance between bike and pedestrian crossings in a closure scenario; and the potential isolation of the Fruit Valley community.

This section presents the potential impacts of the **Vancouver Rail Project** alternatives on some of these issues.

Two positive effects for the community may occur as a result of this project. The first anticipated beneficial effect is increased safety. The general purpose and need for the project includes the goal of increasing safety at the West 39th Street at-grade crossing and the Vancouver yard tracks generally. All build alternatives would increase safety whether West 39th Street is open with a new overpass, or closed completely, because vehicle, bicycle, and pedestrian interaction with the railroad tracks will be reduced. The second beneficial effect is a reduction in the inconvenience and delay to citizens as a result of train crossings at West 39th Street. Currently, freight train traffic blocks the West 39th Street crossing for about eight hours per day and all build alternatives would eliminate delays for drivers, bicyclists and pedestrians.

Are there any potential impacts to social and economic resources?

Social and economic impacts are discussed by alternative. Community concerns were the major focus of this impacts discussion.

Alternative A - No Action

The No Action Alternative would not result in changes in neighborhoods, housing, or public services.

Alternative B.1

Review of the proposed project plan sheets and existing Burlington Northern and Santa Fe Railway Company's (BNSF) right-of-way lines, indicates that as many as 37 properties could be disrupted as a result of this project.

For Alternative B.1 access to and from the west side of the rail yard and tracks would be maintained via the proposed West 39th Street overpass. No effects on the local economy (i.e., to the workforce or specific businesses) are anticipated to result from Alternative B.1. The proposed West 39th Street overpass would be generally safer than the existing at-grade crossing.

Alternative B.1 would have generally positive effects on the provision of police, fire, and emergency medical services to the area. The proposed West 39th Street overpass would provide grade-separated access between the Fruit Valley neighborhood and areas to the east of the rail corridor, where many public services, such as government offices and medical facilities, are located.

Alternative B.2 would eliminate the use of West 39th Street. West 39th Street currently crosses the rail corridor at-grade and provides an access route to and from the Fruit Valley neighborhood residences and businesses. The proposed closure would eliminate the use of West 39th Street. This alternative, however, is not expected to result in isolation of the Fruit Valley neighborhood, as other access routes are available in the area via grade-separated over-crossings at West Fourth

Plain Boulevard, Northwest 78th Street, Fruit Valley Road and West Mill Plain Boulevard.

Closure of West 39th Street would not substantially change access to public services.

The City of Vancouver Fire Department provides fire protection services to Vancouver residents and businesses. Neighborhoods around the rail yard are primarily served by two fire stations. The Fire Department reports that because of frequent closures of West 39th Street due to rail traffic, it is not considered a reliable response corridor.

In addition to emergency response services offered by the Fire Department, American Medical Response Company provides ambulance services to the residents of Vancouver. They generally operate under the assumption that the West 39th Street railroad crossing is blocked by train traffic.[13] The City of Vancouver Police Department provides law enforcement services to City residents and businesses. The City's single police station is located within the central business district, at 300 East 13th Street.

Response to the project area is primarily from the West Precinct, although police response is different from fire and ambulance services in that units are generally on patrol and may be dispatched from anywhere in the response area.

Since emergency services vehicles generally do not utilize the existing at-grade rail crossing at West 39th Street, closure would not affect provision of these services to the west side of the rail tracks and yard.

Alternative B.3 would have effects similar to Alternative B.2 with respect to limiting access across the rail tracks by closing West 39th Street to vehicular traffic. The proposed overpass would accommodate bicycle and pedestrian use of this route. However, results of a pedestrian/bicycle analysis performed in the summer of 2000 indicate that this route (West 39th Street) is not highly utilized by pedestrians and bicyclists. As such, this alternative would not isolate the Fruit Valley neighborhood since other access routes are available.

Alternative B.3 would have effects similar to Alternative B.2 with respect to access to and provision of public services. West 39th Street is not regularly used for fire and rescue calls to the area west of the rail corridor. Alternate routes to access public services located on the east side of the rail corridor are available through grade-separated crossings at West Fourth Plain Boulevard, Northwest 78th Street, Fruit Valley Road, and West Mill Plain Boulevard.

Alternative I

Similar to Alternative B.1, Alternative I.1 would maintain access to and from the west side of the rail yard and tracks via the proposed West 39th Street overpass. No effects on the local economy (i.e., to the workforce or specific businesses) are

[13] *David Evans & Associates, Revised Draft – West 39th Street Rail Crossing Transportation Analysis, April 2000.*

anticipated to result from Alternative I.1. The proposed West 39th Street overpass would be generally safer than the existing at-grade crossing.

Alternative I.1 would have generally positive effects on the provision of police, fire, and emergency medical services to the area. The proposed West 39th Street overpass would provide grade-separated access between the Fruit Valley neighborhood and areas to the east of the rail corridor, where many public services, such as government offices and medical facilities, are located.

Alternative I.2 would eliminate the use of West 39th Street. West 39th Street currently crosses the rail corridor at-grade and provides an access route to and from the Fruit Valley neighborhood residences and businesses. The proposed closure would eliminate the use of West 39th Street. Alternative I.2 is not expected to result in isolation of the Fruit Valley neighborhood, as other access routes are available in the area via grade-separated over-crossings at West Fourth Plain Boulevard, Northwest 78th Street, Fruit Valley Road and West Mill Plain Boulevard.

Closure of West 39th Street proposed under Alternative I.2 would not substantially change access to public services. Fire and emergency medical services generally do not utilize the existing at-grade rail crossing at West 39th Street. Therefore, closure of the West 39th Street crossing would not affect provision of these services to the west side of the rail tracks and yard.

Alternative I.3 would have effects similar to Alternatives I.2 and B.2 with respect to limiting access across the rail tracks by closing West 39th Street to vehicular traffic. The proposed overpass would accommodate bicycle and pedestrian use of this route. As with Alternative B.3, results of a pedestrian/bicycle analysis performed in the summer of 2000 indicate that this route (West 39th Street) is not highly utilized by pedestrians and bicyclists. As such, Alternative I.3 would not isolate the Fruit Valley neighborhood since other access routes are available.

Alternative I.3 would have effects similar to Alternative I.2, B.2, and B.3 with respect to access to and provision of public services. West 39th Street is not regularly used for fire and rescue calls to the area west of the rail corridor. Alternate routes to access public services located on the east side of the rail corridor are available through grade-separated crossings at West Fourth Plain Boulevard, Northwest 78th Street, Fruit Valley Road, and West Mill Plain Boulevard.

Would there be any potential construction impacts?

Construction would occur within the existing railroad right-of-way. Track construction performed on the right-of-way would not impact public services or the general community any more than routine track maintenance. This is because many of the activities associated with railroad construction would occur using specially designed track mounted vehicles which lay track structures while on the tracks themselves.

What mitigation measures are proposed to avoid and/or minimize impacts?

View looking south from the rail yard towards West 39th Street

This social and economic impacts analysis has determined that no adverse community cohesion impacts would result from the closure of West 39th Street. However, and as noted previously, the community has expressed concerns about the isolating effects of the proposed road closure. On-going public involvement and communication with the affected communities could address some of these concerns.

The vehicular and pedestrian/bicycle overpass alternatives under consideration would mitigate, to varying degrees, the community concerns about isolation by keeping West 39th Street open. The Community Resource Team has been supportive of these overpass options. While the vehicular overpass would clearly be used, data showing the extent to which West 39th Street is currently used may not support the construction of a dedicated pedestrian/bicycle overpass.

Through the public involvement process, the community has suggested that a tree-planting program would mitigate the aesthetic and neighborhood impacts associated with the project alternatives.

The traffic study for the project suggests that community concerns about increased traffic on West 39th Street and Fruit Valley Road, and the Kauffman Avenue approach to West 39th Street, could be addressed by signalizing the intersection.

Disruption and Relocation

This section discusses potential disruption and relocation impacts to local residences and businesses, private land owners, and publicly-owned and railroad-owned lands.

Are there any potential relocations or disruptions?

Relocation and disruption impacts are discussed below. Mitigation measures relating to relocation follows the impacts discussion.

Alternative A - No Action

The No Action Alternative would leave the current track configurations unchanged and involve no construction. No construction-related or operation-related impacts would occur and no displacements or relocations would occur.

Alternative B

The proposed track and bypass alignment for Alternative B would result in the disruption and relocation of a number of parcels. These potential disruption and relocation impacts are described in **Exhibits 5-24**. The general location of these properties is presented in **Exhibits 5-25**. For detailed locations, the plan sheets in **Appendix A** illustrate the location of the existing railroad right-of-way and the proposed right-of-way. The area between these two boundary lines identifies the general areas of disruption and relocation.

Up to three homes and one business would be taken as part of Alternative B. Other parcels would also be affected, but for the most part, these parcels are currently vacant. Additional impacts, as they relate to each of the proposed West 39th Street options are listed in **Exhibits 5-26** and **5-27** and illustrated in **Exhibits 5-28** through **5-30**.

Alternative I

Potential impacts resulting from Alternative I are the same as those impacts presented and discussed for Alternative B. Impacts related to the treatment of West 39th Street are also the same as Alternative B.

Would there be any potential construction impacts?

For this resource, all impacts are considered construction impacts and are discussed above.

What mitigation measures are proposed to avoid and/or minimize impacts?

The disruption and relocation impacts are based on the conceptual design of the project alternatives. Some of these impacts may be minimized or even avoided during design of the preferred alternative. During the design process, WSDOT would take steps to ensure that affected properties will maintain or receive reasonable access.

To mitigate residential and/or business relocations, WSDOT would conduct the acquisition and relocation program in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources are available, without discrimination to all eligible residential and business relocatees. If, at the time of acquisition of real property and/or real property rights, it is determined that there is insufficient comparable relocation housing in the vicinity for displaced residents, funds would be available to provide housing of last resort. The following is a more detailed description of relocation assistance programs available to prospective displaced residents.

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), amended in 1987, was written to ensure:

- That owners of real property to be acquired for Federal and federally-assisted projects are treated fairly and consistently, to encourage and expedite acquisition by agreements with such owners, to minimize litigation and relieve congestion in the courts and to promote public confidence in Federal and federally-assisted land acquisition programs; and
- That persons displaced as a direct result of Federal or federally-assisted projects are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole; and
- That Agencies implement these regulations in a manner that is efficient and cost effective.

Occupants who are displaced by the proposed project are entitled to the following benefits under the Uniform Act:

Advisory services. All persons displaced by this project are eligible for relocation advisory services. Such services include, but are not limited to, providing transportation necessary to secure replacement housing, assisting the displaced person in selecting replacement housing, filling out claim forms, and providing the person with continuing and current information on all available replacement housing options.

Moving payments. All persons displaced by this proposed project are eligible for reimbursement for all reasonable, actual and necessary moving costs. A person may either select a scheduled payment amount and move him or herself, or elect to be moved by a commercial mover.

Replacement housing payments. Homeowner-occupants who have occupied the residence to be acquired for at least 180 days prior to the date of the first written offer to purchase the property, are eligible for a number of monetary benefits in addition to relocation advisory services. All reasonable, actual and necessary costs for moving personal property are reimbursable. Certain types of closing costs, loan fees, and increased mortgage interest associated with a new loan are reimbursable. The displaced homeowner is also eligible for the price difference, if any, between the amount the agency pays for the displaced person's home and the asking price of the best available comparable property.

90-day occupants. Residential occupants who have occupied the residence to be acquired for at least ninety days prior to the date of the first written offer to purchase the property, are eligible for a number of monetary benefits in addition to relocation advisory services and reimbursement for moving costs. A rent supplement payment, representing the difference between the base monthly rental of the residence acquired and the rent plus certain utilities at a comparable available replacement property is available for the displaced residents. This amount may be applied towards the purchase of a replacement property should the displaced resident so desire.

Low-income tenants. To ensure that the problem of providing housing for low-income displaced tenants is addressed, an alternative method of calculating the rental supplement is used wherein the person's gross monthly income becomes part of the calculation. This method provides a payment that brings the cost of the

comparable replacement property within the financial means of the displaced person.

Housing of last resort. In the event that replacement housing is not available within the displaced resident's financial means through the application of any of the foregoing benefits, any number of other alternative solutions may be used. These alternatives, known as housing of "last resort", include but are not limited to:

- Purchasing housing for the displaced resident and renting or selling the dwelling at a price within the person's financial means.
- Renovating existing available housing.
- Building new, comparable, dwelling units.
- Providing financing for low income and/or a bad credit 180-day homeowner-occupant.
- Entering into partnerships with public or private agencies which provide housing for low-income persons.

Ninety-day requirement. No residential occupant can be required to vacate their dwelling unless a comparable replacement property has been made available within their financial means at least 90 days prior to the date upon which they would be required to vacate.

Executive Order No. 12898. This order requires that agencies ensure that Federal programs, policies, and activities do not allow for disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. The agency assures that there are no disproportionately high and adverse human health or environmental effects on minority and low-income populations. The environmental justice evaluation for the **Vancouver Rail Project** is discussed in the following section of this document.

Business, Farm and Not For Profit Organization Displacements.

Displaced businesses, farms, and not for profit organizations are entitled to the following relocation benefits under the Uniform Act.

Moving cost reimbursement. This category covers a wide variety of eligible reimbursable expenses related to moving including, but not limited to: disconnecting and reconnecting personal property; packing, moving, and unpacking all personal property required to be moved as a result of the agency's acquisition; costs incurred in searching for a replacement property; costs incurred in changing invoices, business cards, and any other items requiring an address or telephone number change.

Re-establishment costs. This category also covers a wide variety of eligible reimbursable expenses such as the increased costs of doing business at the new location, modifications to the replacement property, new signing, and certain other expenses. This is limited to a maximum total of $10,000.

Fixed schedule move option. This option is available in lieu of all other moving expenses. It is based upon the net operating income of the business or farm. This benefit is limited to a maximum of $20,000. It is particularly attractive to smaller organizations with a minimum of personal property to be moved.

Availability of Residential Housing Opportunities. The type of housing that could be eliminated is older, owner-occupied separate residences in the price range of $100,000.

Based on conversations with local real estate professionals and other published resources, there is an adequate local inventory of existing homes in the area for residential relocation in this price range.

Environmental Justice

Potential environmental justice impacts are discussed in this section. Construction impacts and proposed mitigation follow the impacts discussion.

Are there any potential impacts related to environmental justice or on low income and minority populations?

This section provides an overview of potential impacts to low income and minority populations in the study area.

Alternative A - No Action

The No Action Alternative would leave the current track configurations unchanged and involve no construction. Therefore there would not be any disproportionately high and adverse effects on minority or low-income populations.

Alternative B

Alternative B.1 would result in disruption, and possibly relocation of, residences on the 6000 block of Northwest Fruit Valley Road. Based on review of the 1990 Census data, the neighborhood in which this block is located does not have a high minority population, nor does it have high poverty levels.

The impacts associated with the construction of the grade-separated overpass would occur very close to the current at-grade crossing at West 39th Street, an area that does not have a large minority population or high poverty levels. The block group to the south of West 39th Street and to the east of the railroad tracks does have a significant population living in poverty; however, the impacts discussed above would not impact this area.

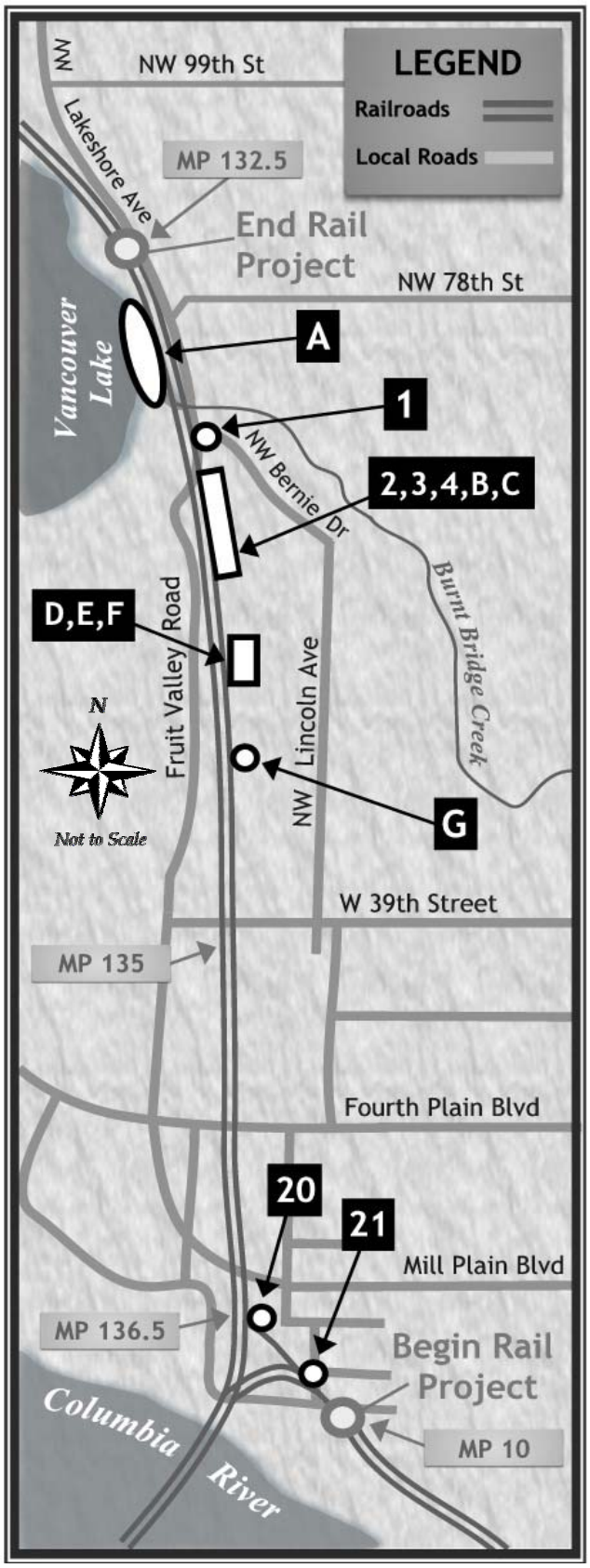
Alternative B.1 would not have "disproportionately high and adverse effects" on minority or low-income populations.

Alternative B: Potential Disruption and Relocations—General Descriptions

Exhibit 5-24

MAP #	ADDRESS	POTENTIAL IMPACT
PRIVATELY-OWNED PARCELS		
1	1901 NW 69th Circle	A portion of the west side of the property (front yard with trees) would be taken. Driveway may require relocation. This parcel is eligible for listing on the National Register of Historic Places.
2	6512 Dogwood Drive	Similar to the impacts to Heathergate Ridge, a portion of the vegetated hillside would be taken.
3	6311 NW Fruit Valley Road	The home and most of the western portion of the parcel would be taken. The proposed bypass alignment travels through this location.
4**	6001 NW Fruit Valley Road	Due to the removal of the private railroad crossing which serves this home, access would be eliminated. As such, this home would be taken.
20	1300 West 12th Street	A small area of the southwest corner of this storage area would be taken.
21	6,473 square foot parcel, primary use is a loading ramp	The loading ramp, which serves the adjacent industrial building, would be taken. This may render the building unusable.
PUBLICLY- AND RAILROAD-OWNED PARCELS		
A	Vacant parcel between Vancouver Lake and the BNSF tracks.	A strip of land located to the west of the tracks |would be taken.
B	City-owned parcel	Vacant parcel just east of the tracks and south of the Lakeshore Drive overpass.
C	Heathergate Ridge Open Space	City-owned open space. A small portion of the vegetated hillside would be taken.
D	Burlington Northern Santa Fe property	A small portion of the western boundary of the parcel would be taken.
E	Burlington Northern Santa Fe property	A small portion of the western boundary of the parcel would be taken.
F	Burlington Northern Santa Fe property	A small portion of the western boundary of the parcel would be taken.
G	Burlington Northern Santa Fe property	A small portion of the western boundary of the parcel would be taken.

***Parcels 7 through 19 are discussed under the proposed options for West 39th Street.*



Alternative B: Potential Disruption and Relocations — General Locations
Exhibit 5-25

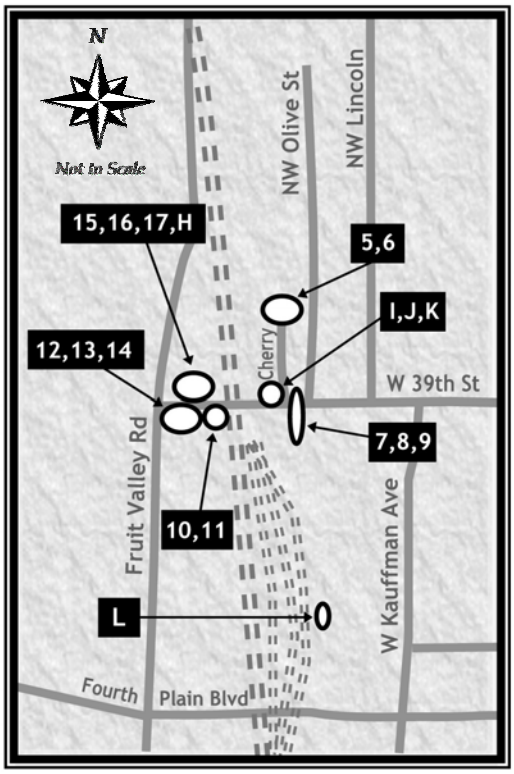
West 39th Street – Options 1, 2 and 3:
Privately-Owned Parcels and Businesses
Potential Disruption and Relocations—General Descriptions
Exhibit 5-26

		POTENTIAL IMPACT		
MAP #	**ADDRESS**	**OPTION 1 VEHICULAR OVERPASS**	**OPTION 2 CLOSE ACCESS**	**OPTION 3 PEDESTRIAN OVERPASS**
5	4401 Cherry Street	Cherry Street access may be modified	Same as Option 1	Same as Option 1
6	4237 Cherry Street	Cherry Street access may be modified	Same as Option 1	Same as Option 1
7	1410 West 39th Street	Parcel and structure may be taken	Same as Option 1	Same as Option 1
8	1406 West 39th Street	Parcel and structure may be taken	Same as Option 1	Same as Option 1
9	37,462 square foot parcel on northeast corner of West 39th Street and Cherry Street	Parcel may be taken	Same as Option 1	Same as Option 1
10	1810 West 39th Street	Access for this business may be relocated to new frontage road	No impact	Minor portion of parcel may be taken.
11	1810 West 39th Street	Access for this business may be relocated to new frontage road	No impact	Minor portion of parcel may be taken.
12	1900 West 39th Street	A portion of the south side may be taken. Access may be relocated to new frontage road	No impact	No impact
13	1907 West 39th Street	A portion of the north side may be taken. Access may be relocated to new frontage road	No impact	No impact
14	1901 West 39th Street	A portion of the north side may be taken. Access may be relocated to new frontage road	No impact	No impact
15	1815 West 39th Street	The entire parcel may be taken. Access may be relocated to new frontage road	No impact	No impact
16	3 acre parcel on north side of West 39th Street	Access for this business may be relocated to new frontage road	No impact	No impact
17	1801 West 39th Street	A portion of the north side may be taken. Access may be relocated to new frontage road	No impact	Same as Option 1

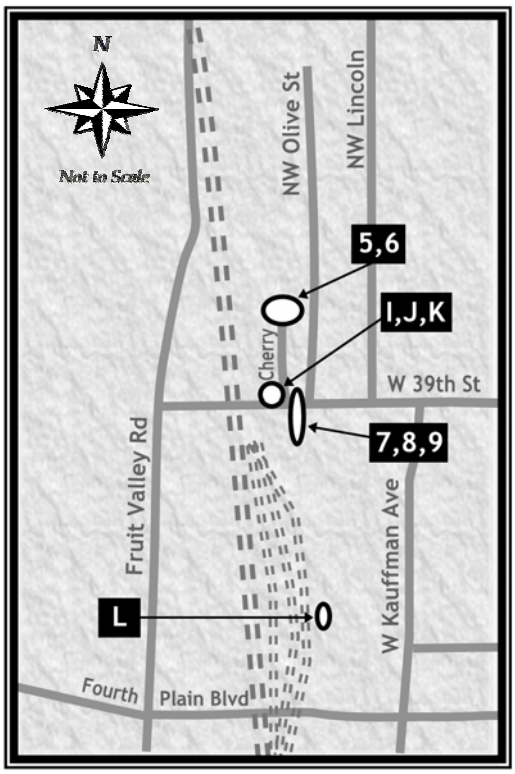
West 39th Street – Options 1, 2 and 3:
Publicly- And Railroad-Owned Parcels
Potential Disruption and Relocations—General Descriptions
Exhibit 5-27

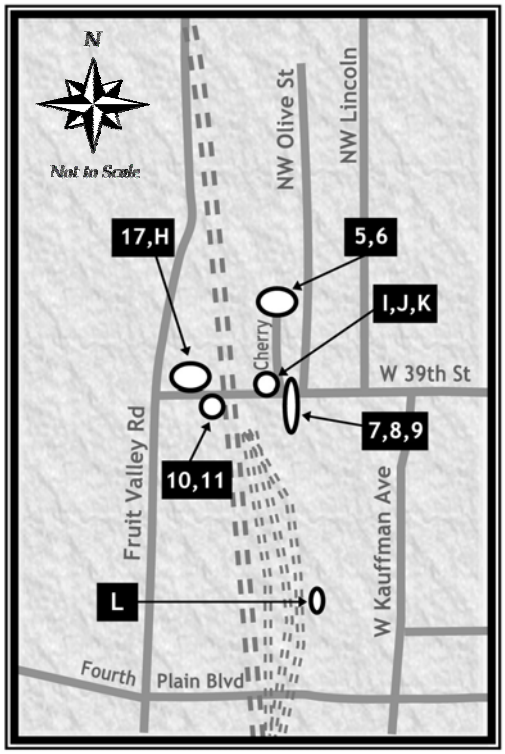
		POTENTIAL IMPACT		
MAP #	**ADDRESS**	**OPTION 1 VEHICULAR OVERPASS**	**OPTION 2 CLOSE ACCESS**	**OPTION 3 PEDESTRIAN OVERPASS**
H	City of Vancouver – 1810 West 39th Street	Access may be relocated to new frontage road	No impact	Same as Option 1
I	Burlington Northern Santa Fe property—1512 West 39th Street	Entire parcel may be taken	Same as Option 1	Same as Option 1
J	Burlington Northern Santa Fe property—1508 West 39th Street	Entire parcel may be taken	Same as Option 1	Same as Option 1
K	Burlington Northern Santa Fe property – one acre parcel	Entire parcel may be taken	Same as Option 1	Same as Option 1
L	12,000 square foot City-owned parcel near Columbia Crest	Entire parcel may be taken	Same as Option 1	Same as Option 1

Relocation and Disruption
Potential Impacts: Option 1
Exhibit 5-28



Relocation and Disruption
Potential Impacts: Option 2
Exhibit 5-29





Relocation and Disruption
Potential Impacts: Option 3
Exhibit 5-30

While no low-income or minority populations were identified immediately adjacent to the West 39th Street grade crossing, there are two areas that are nearby with low-income and minority populations: there is a cluster of census blocks with relatively high minority populations to the north and south of West 39th Street in the vicinity of Lincoln Avenue. There is also a cluster of high minority census blocks within a census block-group with high poverty rates in the vicinity of the intersection of West Fruit Valley Road and West Fourth Plain Boulevard. No changes or significantly longer travel routes to facilities and services located on the east side of the rail corridor are expected to result from this alternative.

The impacts associated with Alternative B.2 do not represent "disproportionately high and adverse effects" to minority or low-income populations.

This alternative would have positive results for pedestrians and bicyclists due to the fact that travel safety is improved and there are no changes in travel distance. Residences affected are not within the census blocks with high minority populations or low-income block groups.

The impacts associated with Alternative B.3 do not represent "disproportionately high and adverse effects" to minority or low-income populations.

Alternative I

Alternative I.1 would have the same effects as Alternative B.1, discussed above, with respect to low income and minority populations. Similarly, Alternative I.2 and I.3 would have the same environmental justice impacts as Alternative B.2 and B.3, respectively.

Are there any anticipated construction impacts?

All improvement construction would occur primarily within existing railroad right-of-way. Track construction, performed on the right-of-way, would not impact minority or low-income populations any more than routine track maintenance. This is because many of the activities associated with railroad construction would occur using specially designed track mounted vehicles which lay track structures while on the tracks themselves.

The proposed railroad improvements would occur primarily within the existing railroad right-of-way.

What mitigation measures are proposed to avoid and/or minimize impacts?

None of the alternatives are anticipated to have impacts on low-income or minority populations. Through the public involvement process, the community expressed concerns about the potential isolation of the neighborhoods to the west of the rail yard and tracks that could result from the **Vancouver Rail Project**. Alternatives that feature construction of a West 39th Street overpass would address those concerns to some degree.

Visual Quality

The **Vancouver Rail Project** would predominately be located within the existing rail right-of-way, where existing track and supporting structures already exist. The addition of railroad facilities would be a small incremental change, which would be unnoticeable in most locations. The proposed project would allow trains to move through residential views faster, especially at the siding location. The improved siding would allow trains to move past each other concurrently, rather than forcing one to stop and wait while the other passes. Overall there would be no change in visual quality.

Are there any potential impacts to visual quality?

Visual quality impacts are discussed by alternative.

Alternative A (No Action)

Alternative A would not result in any changes to the existing configuration of railbed and track, nor would it have any effect on the visual quality in the study area. Therefore, there would be no change to the existing visual landscape of the area.

Alternative B

Visual quality impacts of Alternatives B and I would be identical. The Vancouver Rail Project would be located primarily within the railroad right-of-way and would be similar in appearance to the existing tracks and supporting structures. The visual experience for rail passengers is not anticipated to change as they are unable to view tracks ahead, behind and very near to the train.

The existing Vancouver rail yard visual quality is low. The visual quality assessment model results demonstrated existing and foreseen visual quality conditions in the study area would be the same. There would be a slight decrease in visual quality resulting from some tree and brush removal.

The Vancouver rail yard would remain a typical rail yard facility. For Alternative B, the visual quality of Vancouver rail yard would improve slightly as the track would now route around the perimeter of the yard, however the score would remain "low" (1) for vividness, unity and intactness. The project would enhance visual quality from the passenger's perspective, in that the passengers would travel faster past the rail yard following its completion.

A new residential development, Columbia Crest, would be adjacent to the **Vancouver Rail Project**. Views of the rail yard from the residences would be screened by a detention pond and property fencing located on the back of developed lots. The views of the existing rail yard from an older residential area could be partially affected by cuts along the bluff base. The bluff is now vegetated with brush and woody species. Varying amounts of slope vegetation would be removed, depending on the slope configuration. The top portions of the slopes would not be cut, thus some vegetative screening would remain.

Alternative I

The visual quality impacts of Alternative I would be the same as those for Alternative B discussed above.

Would there be any construction impacts?

Some visual quality impacts would result from temporary construction. Equipment would be visible to residents, although generally railway construction is completed fairly quickly. It is anticipated that the construction crews, equipment and timing would be similar to regularly scheduled maintenance operations, such as for replacing fouled ballast. It is advisable that temporary construction impacts be mitigated by use of BNSF design standards, which include re-vegetation along cut and fill slopes. Re-vegetation with native vegetation and locating vegetative buffers where cuts have occurred near residential areas would enhance the visual quality of the study area.

What mitigation measures are proposed to avoid and/or minimize impacts?

Changes in rock ballast color are anticipated in some locations, but the changes would be subtle and based upon the age and use of existing ballast. To minimize color changes, the ballast would be delivered from BNSF quarries.

Additional mitigation could include replacing removed vegetation with native vegetation or locating vegetative buffers beneficial to the visual quality along portions of the **Vancouver Rail Project** where cuts or fills have occurred within site of residential viewers. Following construction, the visual quality is anticipated to return to near pre-existing conditions for the study area.

In summary, what impacts would result from the proposed alternatives?

Exhibit 5-31 provides a summary of findings for the land use analysis for the **Vancouver Rail Project**.

Land Use—Summary of Potential Impacts*
Exhibit 5-31

ALTERNATIVE	IMPACT	EXPLANATION
Alternative A	-	Continued safety concerns at West 39th Street
Alternative B		
Option 1	+ + + - -	Emergency services would use West 39th Street for response Increased options for safe access to recreational facilities Decreased risk of accidents at grade crossing Four potential residential relocations Two residential driveway re-alignments
Option 2	+ - - -	Decreased risk of accidents at grade crossing Perceived isolation by community Two potential residential relocations Two residential driveway re-alignments
Option 3	+ + - -	Increased options for safe access to recreational facilities Decreased risk of accidents at grade crossing Two potential residential relocations Two residential driveway re-alignments
Alternative I		
Option 1	+ + + - -	Same as Alternative B, Option 1
Option 2	+ - - -	Same as Alternative B, Option 2
Option 3	+ + - -	Same as Alternative B, Option 3

**Construction impacts are only included for potential relocation and disruption impacts*